FAA AVIATION NEWS

DECEMBER 1974 JANUARY 1975

FAA AVIATION NEWS

COVER:
Over the river and through the sky to Grandmother's house

FAA AVIATION NEWS

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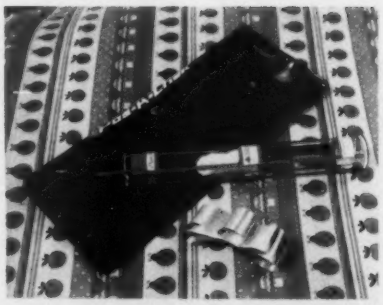

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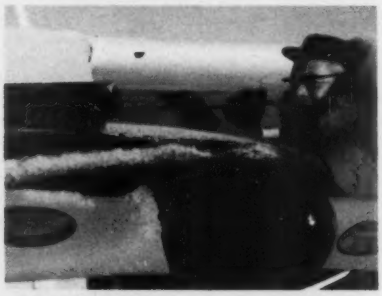

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Home for the Holidays

Dear Mom & Dad:

Just a line to say once more how sorry I am that we couldn't make it to the farm for Christmas. I know you've been counting on having us all together for the holiday, and we are disappointed, too, but mostly right now we are feeling very lucky and glad to be alive. What I didn't tell you on the phone yesterday was that we were involved in a little airplane "incident"—or to be more specific, the engine all but quit in the air. We had to declare an emergency, and we barely got back to the airport.

Now don't get uptight and start running for the phone. Read the letter first. Nobody got hurt, and I learned something about flying that will make a safer pilot out of me, so maybe you can look on that as a kind of Christmas present (all the packaged stuff we were bringing will arrive by mail soon—I hope).

You know I'm a pretty methodical guy by nature, and you can imagine that for this flight in our little second-handbird with Jennifer and the kids on board I wasn't about to take any chances. I had everything planned out days ago: route (and alternate routes in case the weather went sour), flight times, distances, VORs, frequencies, latest NOTAMS—you name it. The day before the flight I checked on the weather at about 20 different stations, and re-checked most of them before daybreak on the morning we were scheduled to go.

I was as heartless as old Scrooge himself on limiting the luggage and presents the kids could take along, and I drilled them on the importance of staying belted in their seat at all times. I even had Carl, our local I.A. mechanic, perform the annual inspection on the airplane, which wasn't due for another 30 days—clean bill of health.

I personally watched over the topping off of my tanks on the night before takeoff, as I knew about a hundred guys would be flying off home somewhere for the holidays on the day before Christmas, and I wanted to be off the pavement at first light, so we could have a nice, leisurely flight, with comfort stops along the way, and still get to the farm well before dark.

Well, off we rose with the sun, and I tell you I just couldn't believe it when after a few minutes in the air the engine began to sound sick. I tried adjusting the fuel mixture, but all that did for us was to produce a wracking cough up front.

I lowered the nose of the airplane until we practically stopped climbing, but I still couldn't get the airspeed up over 80 miles an hour. (Usually at that point we are doing about 130 and climbing through 2,000 feet or better.) Out of the corner of my eye I could see the needle on the oil temperature gauge inching up toward the red, and then I knew it wasn't just me—something was really wrong with this pampered bird.

I started a wide shallow turn to the left, which didn't seem to upset anyone in the airplane, and I guess they didn't hear me, over the engine's racket, when I radioed the control tower I was turning back and asked

for a straight-in approach. But then the tower's reply came booming out of the receiver—

"Two, three Zulu, understand you have an engine problem, a straight-in approach to Runway 17 is approved. Do you require crash/rescue equipment standing by?"

At that moment I felt four pairs of anxious eyes boring into me, and a little chorus of "Daddy, are we going to crash?" started up in the back seat.

I calmed them down, said negative to the crash/rescue unit, and set up a shallow glide, using as little engine power as I could, and still hope to make the airport. About a mile short of the runway the engine was making such a racket that I cut the power and trimmed the plane for best glide. We came in over the threshold with about ten feet of altitude to spare and a lot of silent prayer.

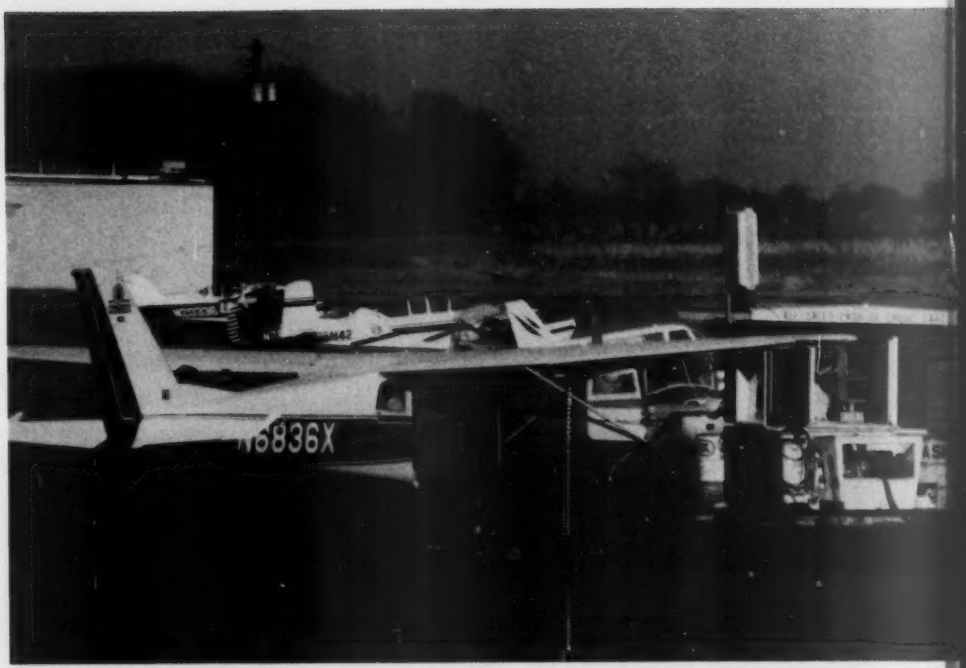
Once down, I didn't dare try starting up that hot engine, but called to the shop for a tow, which seemed kind of amusing to the kids, but a little embarrassing to me. There was a long line of planes taxiing for takeoff, and some of the pilots who knew me waved. They had all slept later than me that morning, and it looked like they were going to reach their destination a lot earlier. Jennifer unclenched her grip on the seat and asked me what had happened.

I told her I didn't know. Maybe bad plugs.

"I thought you said you had that great mechanic, what's-his-name? go over this machine with a fine tooth comb."

"I did. You can ask him for yourself. He's coming over now.

I had the impression Jennifer was gearing herself up to say a great many things,



It was the night before Christmas Eve, and all the eager little airplanes were gassing up for the holiday flight—with the wrong fuel.

some uncomplimentary, to Carl, but fortunately before he reached us a toilet crisis had developed and she had to hustle the whole kiddie troop over to the restroom.

Carl leaned on the cowling and gave me his amiable grin. "Merry Christmas," he said.

"You bet." I told him, detail by detail, what had happened and I asked him what kind of plugs he had put into the engine.

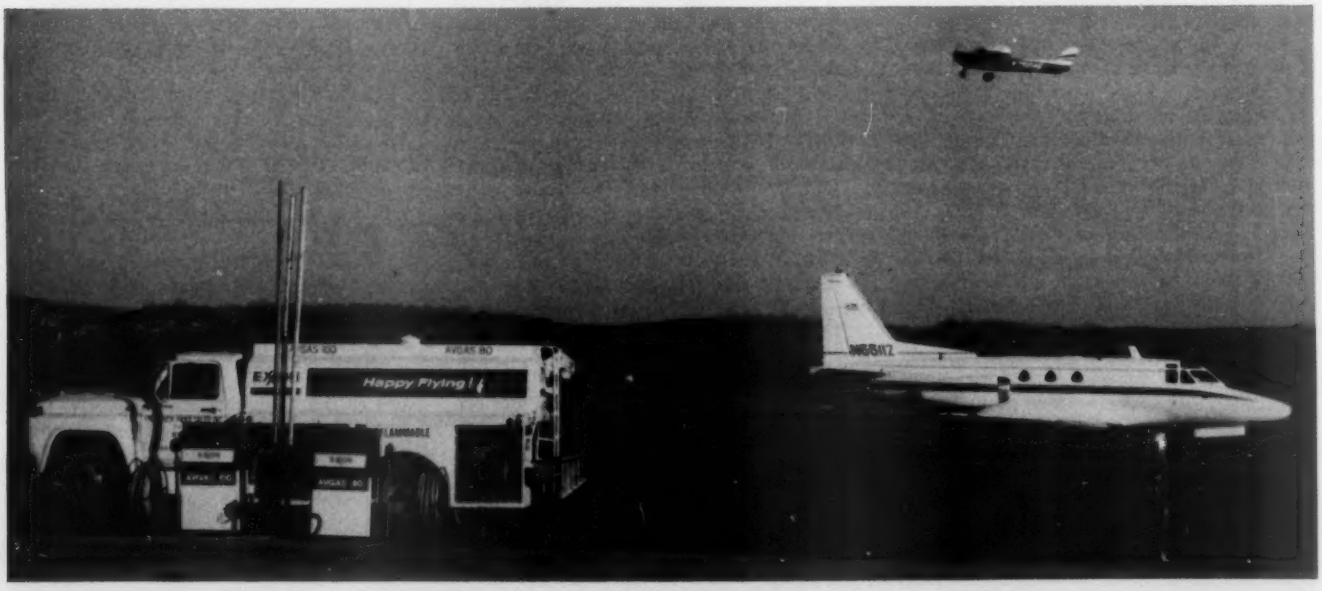
"Same ones you had before. They checked out okay."

"You should have heard that engine. What do you suppose is wrong with it?"

"Sounds like something it et. Where'd you fuel up?"

"Right here, last night. As a matter of fact, I got into a big hassle with a clerk in the office because they tried to charge me for 50 gallons, when I know I couldn't have been down more than 30. There was a whole bunch of pilots waiting to pay their

The presence of jets increases the potential for misfueling. Labeled fuel compartments are fine—but no substitute for pre-flight check.



bill, so I finally settled for 35, which still wasn't right. I think they got my bill mixed up with someone else's."

"Maybe they got your fuel mixed up too."

"No way. I watched it. The hose came out of a truck marked 100 octane. And I drained about a pint out on the grass this morning. Believe me, it was green."

Carl rummaged around in the cockpit, found an empty soft drink bottle and drained some fuel into it. "Kind of a pale green, wouldn't you say? Doesn't smell too good either. Here, take a sniff."

Well, it smelled like gasoline to me. But it also smelled like something else. . . .

"Kerosene," Carl said. "About half and half, I'd say. You were lucky your tanks weren't down. You'd never have cleared the trees."

"How can you tell?"

Carl poured a few drops on my hand. "Feel it. Feel that greasiness? You don't find that in gas. That's jet fuel."

I was still positive that the truck that fueled my airplane said 100 octane Avgas on it. Anyway, I said, what about all the other guys with piston planes who'd fueled from it—?

Carl's grin faded. "That's right. Listen, you're not going anywhere for a spell, so maybe you want to go and call up your folks or make some other arrangements. I've got to make a call myself. Be back in about ten."

That was when I called you with the sad news, after checking with the commercial carriers and finding no seats available until *after* Christmas. I didn't tell you anything other than that the plane wouldn't fly, because I know you've got a wild imagination, and I didn't want to get your blood pressure up.

Meanwhile Carl had called the tower and got them to contact every airplane within radio range that might have taken off on the same fuel I had. Only two planes got off the ground before being warned. One of these turned back and landed right away. The other one lost its engine about 15 miles out and crash-landed in a plowed field, but everyone got out safely. Every direction you looked on the airport, some guy was squatting under his airplane drain-a fuel sump. Crazy.

"How long before I can get going?" I asked Carl when he ambled back.

"Hard to say offhand. Maybe two or three days."

"Two or three days!" I couldn't understand how it would take that long to flush the tanks and refuel them.

"Well, I like to look on the bright side," Carl admitted. "It could be two or three weeks, maybe longer. It all depends on how much the engine was overheated and for how long and what that did to the insides. I'll know something when I look at the plugs. Then I'll have to run a compression check on all cylinders, and make a borescope examination of the interior of each cylinder. See if there are any deposits on the walls or the piston dome."

"You couldn't just look real hard at the spark plugs?" I said, seeing a Christmas thinned wallet getting skinnier and skinnier.

"Nope. It's all spelled out in the manual. Have to drain the oil too, and check the screen for metal shavings. When an engine overheats, you can get bare metal grinding on metal. There's a few other things to look into. Then I'll sit down and figure what I have to do before I turn you loose."

"It sounds to me like I could be in for a new engine."

"You could. Maybe not. Anyway, look on the bright side. You and your family got down safe and sound, didn't you? You can't knock that."

"What I'd like to knock," I said, "is the guy who filled up that tank truck labeled Avgas with jet fuel. A hundred people could have been killed."

"Maybe. But maybe it wasn't the truck driver's fault. Maybe somebody poured jet fuel into a storage tank labeled Avgas at the tank farm. Maybe somebody switched signs on him. There's always a chance that a mix-up like that can take place. You're the only guy who can make sure it doesn't bust your plane up."

I got a little red in the face, because I knew what he meant. Practically every instructor I had ever known advised me to check my fuel before flying, not by letting it pour out on the ground but by draining the fuel sumps into a clear container. That's the only sure way of seeing what's in the tanks. Jet fuel being colorless, doesn't change the coding color, just dilutes it.

Seeing my family approaching, Carl spared the lash. "You aren't the only pilot who had to learn the hard way," he said. "I'll bet you, there are hundreds of guys every year who go barrelling off into the blue with the wrong stuff in their tanks and mess up an engine. Most of the time they manage to get down safely, so you never hear about it. But it doesn't have to happen. It's up to you."

Carl diplomatically removed himself from the scene while I explained to Jennifer and the kids that the engine was sick, and we would not be flying anywhere this Christmas. You can imagine the groans, wails and tears! Well, on the way home we managed to pick up a leftover Christmas tree, and a scrawny frozen duck and a few other trimmings, by means of which your gifted daughter-in-law is somehow providing us with a cheery holiday feast, so there's no need to feel sorry for us.

And no need to worry, either, about my flying, because the one resolution I intend to keep this New Year is to kick the habit of spilling out gas and calling that a fuel check. Just to make sure I keep my promise, Jennifer and the kids presented me with an ornately wrapped plastic container, purchased at the airport, especially designed for the man who has everything except a few grains of common sense. Happy holidays!

Your son the pilot

Some fuel drainage flasks on the market will separate water from fuel for you, as well as make it easy to examine the color in your tanks. Wait an hour after topping for check.

The subject of improper fueling and fuel contamination is discussed in an FAA Advisory Circule (AC 20-43B) "Aircraft Fuel Control". For a free copy write DOT/FAA Distribution Unit, TAD 484.3, Washington, D. C. 20590.

Getting Started in Winter

The trick is to get the airplane warmed up while the pilot stays cool

Frosted plugs are a common cause of no-start on wintry mornings. Preheating saves delay.

You do not have to live in Alaska to feel the effects of winter weather on flying. In any area of the country where the temperature drops below freezing during the night, extra preflight preparations and some changes in ordinary flying procedures may be needed to ward off mechanical mishaps brought on by Old Man Winter.

Perhaps the most common (and least expected) occurrence that can take place in an airplane parked outdoors on a frosty night is the condensation of moisture in the closed cabin or within the air ducts. Many a pilot has taken off on a beautiful crisp clear winter morning only to find himself abruptly socked in by a fog of his own making, as moisture condenses on the *inside* of his windshield. The preflight program in winter should always include operating the cabin heater *on the ground* long enough to purge the system of moist air.

The pilot's warm breath is also a source of moisture which can cloud up window glass, as well as the windshield, in cold, damp weather. Since breathing is rather necessary, the best precautionary measure is to preheat the cabin before takeoff, especially when it is to be fully occupied, with a portable space heater. Many airport fixed base operators have specially designed heaters for this purpose. For a reasonable fee and with suitable advance indication they will have both the airplane engine and the cabin nicely warmed for you when you arrive on the scene. If you arrive in time to oversee the preheating operation, make sure that hot air blasts are not directed at flammable parts of the aircraft such as upholstery or fuel, oil or hydraulic lines. A charred airplane can upset your whole day's schedule.

When it comes to actually starting the engine, many pilots are interested in one thing only: a live and kicking engine. But other pilots, particularly pilot/owners, are also interested in getting the engine started without scoring the cylinder walls, getting raw fuel into the exhaust system, wearing down the battery, or starting a little impromptu bonfire. In a word, the incautious or eager-to-get-going pilot will overprime.

An engine which is slow to start in cold weather may be sluggish because congealed oil hampers the cranking action, or because the fuel does not volatilize sufficiently, or for various other reasons, none of which are helped by flooding the engine with fuel. An excess of fuel in the cylinder tends to wash the protective coating of oil from the walls, leaving them more vulnerable to scoring from the piston. Raw, unburned fuel in the exhaust system leads to deterioration of the components. If the engine turns over very stiffly and it is not convenient to preheat it, the prop may be pulled through by hand a few times, with the master switch and magnetos off, of course, and the aircraft securely held by brakes and tie-downs, or chocks. Hand-prop with extreme caution: any propeller that is linked to an engine *may* start with the least encouragement, regardless of switch positions. Serious accidents involving hand propping occur every year.

Out of the Cold

A time-honored practice to prevent the congealing of oil is to drain the oil out at shutdown, keep it in a heated building overnight, and pour it back into the crankcase just before start-up. It can be a somewhat messy operation, but it does save the battery and reduces the likelihood of overpriming.

The viscosity of the grease and oils used in an aircraft engine in winter is very important. The engine manufacturer's recommendations on oil additives should be closely followed. Oil lines should be inspected for loss of insulating material, which could lead to congealing, in very cold weather, and possibly incorrect temperature gauge readings. Repairs must be carried out by a certificated airframe and powerplant mechanic, using fireproof insulation.

The crankcase breather deserves special consideration in cold weather. During normal combustion some moisture enters the crankcase past the rings as a vapor. When the vapor cools, it may condense in the crankcase breather lines and subsequently freeze them closed. As a result, during the next flight, excessive pressure may develop in the system and rupture the front crankcase oil seal, causing oil leakage which may cover the windshield. If the engine oil pressure reads high on starting, or if the engine smokes or leaks oil in cold weather, the possibility of ice in the breather lines should be investigated. For aircraft that must operate regularly in very cold, damp conditions, a change in the breather system may be advisable. Any such modification should be approved by the manufacturer, or FAA, to eliminate fire hazard.

When an engine that has not been preheated on a freezing day starts, runs briefly and then stops and will not restart, the problem may be icing of the sparkplug electrodes. What happens is that some of of the moisture formed during the brief period of combustion settles on the cold electrodes and forms ice before sufficient heat can be developed inside the cylinder to prevent freezing. This of course shuts down the engine, and nothing will restart it short of removing the plugs and heating them in the most convenient manner.

Remember that new pressure gaskets should be installed every time plugs are replaced. Used gaskets, being constructed of copper, are hardened by heat during use, and will not seat properly once removed, unless they are annealed. Poor seating of gaskets may cause defective heat transfer during the operation of the engine, and may eventually lead to overheated plugs, faulty ignition, etc.

Below—portable preheater funnels hot air into engine compartment with tarpaulin in place. Above—over-priming, a common cause of balky engines, is also a fire hazard.

Turbine engines give less trouble than piston types in cold weather, but it is recommended that ground power units be used wherever possible. If you make your start with the aircraft facing into the wind, you avoid the possibility of a "hot start" (burning of excess fuel in the burner cans or tail pipe). Fire hazards are always greater in winter, when the presence of a fire guard is especially important.

As the outside air temperature drops at the surface, and the air becomes denser, the potential power output of a piston engine increases. Supercharged or turbocharged engines can be easily overboosted (and possibly damaged) if the pilot does not calculate the proper manifold pressure or engine pressure ratio for the current pressure altitude and ambient temperature.

With simple piston engines with controllable pitch props there is also danger of harmfully exceeding the rated horsepower in subfreezing temperatures, if full power is used during the climbout, beyond the point of necessity. Power output increases at a rate of about one percent for each 10° F. of temperature below standard air temperature (59°F. at sea level). This means that the temperature would have to drop to around zero, for you to get more than a five percent overboost in power. Many aircraft do operate in these conditions, however, in the northern states and in Alaska. In subzero climate, aircraft engines could develop as much as 10 percent more than the rated horsepower, even though manifold pressure and RPM limits are not exceeded.

When the airplane engine is delivering more than normal power there may be a noticeably improved climb power—a reversal of the effects of density altitude in hot weather. However, pilots should avoid unnecessary full-power operation because of the danger of internal engine damage from excessive pressure. It is possible to blow off a cylinder head in this manner.

What do you do about engine overheating during climb? The appropriate procedure for each aircraft is detailed in the aircraft flight manual by the manufacturer, and should be followed precisely—procedures vary from one design to another. In some cases, the pilot may be advised to maintain a higher airspeed during the climbout, or to reduce power slightly, or both. Excessively lean fuel/air ratio can cause high cylinder head temperatures.

Careful with carburetor heat

In other cases, the pilot is advised to use carburetor heat during takeoff and climbout within a given temperature range, as a means of assisting the gasoline to vaporize correctly in spite of the cold. Carburetor heat, under these conditions, may also prevent an excessive leaning of the fuel/air mixture during takeoff, since the density of the outside air increases directly as the temperature drops. Carburetor heat should never be applied haphazardly. If used ill-advisedly it can actually induce carburetor icing, in some circumstances, by raising the mixture temperature to just below the freezing point. For pilots who fly regularly in very cold weather, a mixture temperature gauge is a good investment.

Power overboost is not the only potential cause of engine overheat while climbing out. Aircraft that are equipped with engine baffles, winter fronts or oil cooler covers, may overheat on climbout under certain weather conditions, such as a sudden thaw or warming spell. The restricted flow of air for engine cooling purposes due to the baffles may be insufficient for proper cooling during an unexpected thaw or warming spell. The pilot must monitor the cylinder head temperature gauge, and at the first sign of trouble follow the approved procedure for reducing the temperature—usually opening the cowl flaps, if pilot-controllable, or increasing airspeed, or both.

Incidentally, FAA approval is required for any installation of engine baffles, winter fronts, etc., unless specified by the manufacturer. Engines which depend heavily on airflow for cooling purposes can be damaged to the point of complete failure if operated even for a relatively short time outside of the normal heat range. If you do not have a cylinder head temperature gauge on your airplane, you are probably safer without adding winter baffles.

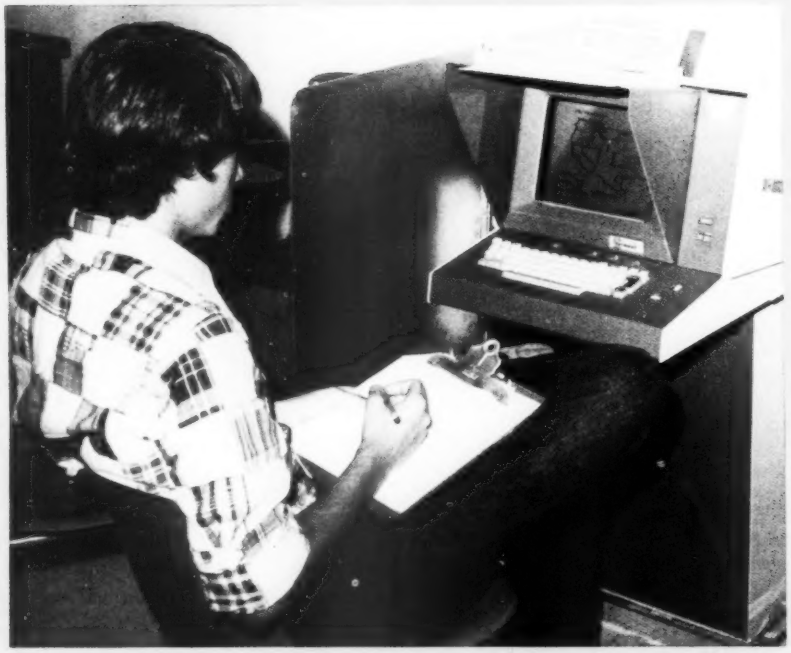
The opposite problem to overheating—keeping the engine warm enough for smooth operation in very cold weather—is most likely to occur during letdown and approach to a landing. Under reduced power, engine heat may not be sufficient to vaporize fuel fully and maintain the proper air ratio in the mixture, especially without some form of winter covers. In this phase of flight the pilot has recourse to several procedures for increasing engine heat. By extending landing gear or flaps at an early stage of the approach he can carry a higher power setting without increased airspeed. He can also use carburetor heat. His choice of procedures would depend, again, on the engine manufacturer's recommendations for his airplane.

While preflighting in winter, it is especially important to pay attention to the feel of the control cables (engine as well as airfoil). Moisture may freeze during the night before a flight in such a manner as to restrict the movement of control linkage.

Careful fuel sump drainage and inspection is another preflight item that increases in significance in winter, because of the possibility of water in the fuel freezing in lines and filters and causing stoppage. It is also possible for moisture to be present in the tanks in the form of ice, which goes undetected during an early morning inspection, but causes trouble later when it melts. Your best protection, if the airplane cannot be kept in a heated hangar, is to top the tanks after each flight, and to drain the sumps for additional inspections during the middle of the day.

As a precaution against inadvertent braking, removable wheel fairings should be taken off before the airplane is flown in wintry weather. Otherwise slush or mud thrown up into the fairing during the takeoff may freeze solidly and interfere with the spinning of the wheels on landing. Pilots flying aircraft with retractable gear should recycle the gear several times after taking off, in order to free the equipment as much as possible from the accumulation of freezable muck that would prevent extension of the gear later.

A fuller discussion of this subject is available in "Cold Weather Operations," (FAA Advisory Circular 91-13A). Send a mailing label to DOT Distribution Unit, TAD-443.1 Washington, D.C. 20590, when requesting your free copy.



Do it Yourself Pilot Briefing

Editor's Note: The automated briefing terminal is FAA's proposed reply to the problem of meeting the huge increase in pilots and demands for pilot services projected for the decade ahead. We now have 800,000 active pilots on record. Current projections call for a threefold increase in this number by 1985. Considering that FAA's present network of 300 manned flight service stations is already overburdened by the demand for pilot services, it is apparent that expanding existing facilities and personnel to keep pace with growing needs would involve a tremendous increase in costs—the annual outlay by 1985 could triple 1974 costs. In all likelihood, users of the system would have to pay for these soaring costs.

One of the best alternatives FAA sees at present is a new system that would eventually consist of many more than 300 self-briefing stations, located at numerous airports and tied electronically to large manned stations, or hubs, as well as to regional data processing centers. The data centers would receive continuous reports from strategically located weather monitoring equipment in the form of digitized data, allowing for ultra-rapid processing and transmitting of essential flight information.

An experimental form of the pilot self-briefing terminal, developed by FAA's National Aviation Experimental Center (NAFEC) at Atlantic City, has been sent to a dozen airports around the country over the past six months. Pilot organizations and individual pilots have been invited to utilize the terminal to plan a flight, and to compare for themselves this experience with flight planning at the adjacent "live" FSS. An observer from NAFEC is present at each "automated" briefing, to answer questions and to evaluate the practical usefulness of the material presented.

The self-briefing station consists of a cathode ray tube (or "screen") with a keyboard that the self-briefing pilot can use to call up desired and available information, and to file flight plans and pilot reports. There is also a copying machine which prints out for him any of the information shown on the scope, on sheets of paper he can take with him. The data available is all "actual" and is derived from computers at a central processing facility utilizing the latest Weather Service and Air Traffic Service reports. To date, nearly 1,000 pilots across the nation have participated in the tests. The following account is the personal experience of a pilot in Texas.

"So this is how we'll be flying in 1985," I thought to myself as I entered the Houston FSS to see and experience a slice of the future. I had come with a group of other Texas pilots who'd been asked to test the experimental pilot self-briefing terminal in its early form, as well as be tested on how well we could get along with a nonhuman but highly sophisticated briefer. We were conducted to an upstairs room.

There it was, sitting patiently in a corner of the room, with the typical green complexion of a cathode ray screen and the businesslike appearance of a typewriter keyboard. This, I thought, is the robot monster that is out to change the way I, and almost every other general aviation pilot, prepare for a flight. It is supposed to replace the friendly human being behind my neighborhood FSS counter, Charlie, a guy I'd learned to like and trust and occasionally win some money from at poker. It's supposed to save me money and help me fly safer, better. *So they say.*

Frankly, I didn't trust it. Oh, I'm in favor of progress, liberation, etc., but I always felt that you couldn't build into a computer all the things that go into a good, accurate weather briefing by a qualified FSS specialist. How are they going to give you the intangibles, like the local terrain knowledge a guy picks up from living in, and flying over, an area for a dozen years? Like the confidence you get from talking over the flight with someone that knows all about your problems as a pilot? Like knowing the guy cares about what happens to you and your wife and your kids? God knows a fancy computer can't lead a low-time pilot around by the hand the way Charlie can.

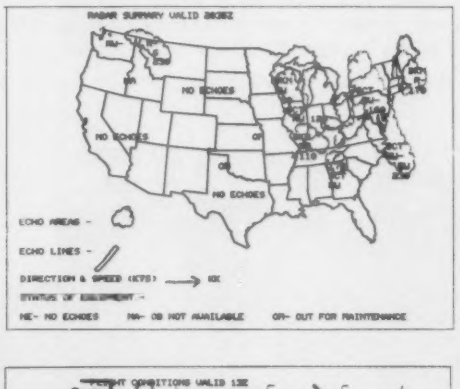
Well, I'm seated at the machine and I get a five minute introduction on how it behaves. Seated alongside me is a specialist from NAFEC, not to wet-nurse me through the ordeal but to record how I get along with it, how much time it takes me to absorb information from the console, using only the instructions from here on in that come galloping across the screen. He will correlate this with my flying experience (a little over 300 hours). He is not interested in my education, profession, age, sex, or any other personal information, so I don't feel like I'm being shadowed by Big Brother.

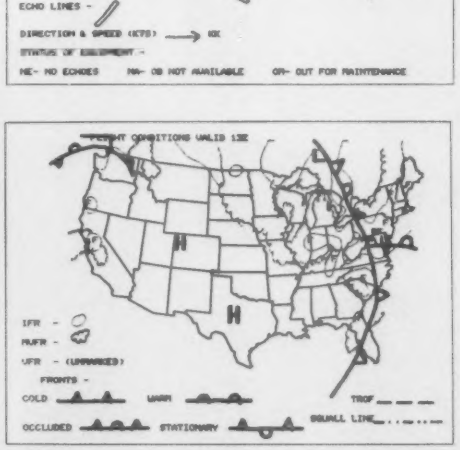
My group of "test pilots" should present a good cross section of guys who fly. On my left is a corporate four-striper who pushes a *Jetstar* around the sky for a living. On my right is a lass with all of three hours in a Cessna 150, who only minutes ago finished her private pilot written exam in an adjoining office. For balance, you have me in the middle—the typical sometime flyer.

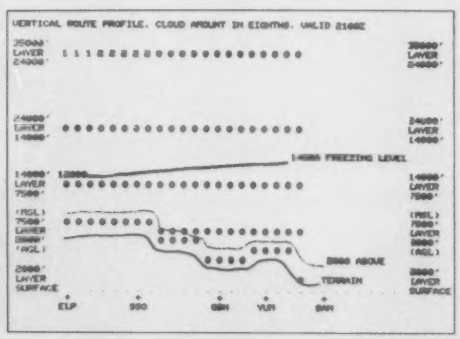
With a faint, business-like hum, my new computerized acquaintance goes to work,

setting the ground rules and giving me some choices. "All times are GMT," it says, even supplying me with the formula for computing Zulu time. So score one for the leading-green-or-forgetful-pilots-around-by-the-hand department. Under the "options" item, I find that, depending on my response, the machine will give me a briefing on local weather only; a low or high altitude route-oriented briefing; weather at any specific location; plus the opportunity to file, close or cancel a flight plan or give a pilot report. I can also, at the push of a key, "terminate the use of this device at any time," and walk out of there without causing any hard feelings.

A tremendous variety of displays are available to the self-briefing pilot, including, top to bottom, summary of radar echoes; flight conditions; and a vertical route profile showing cloud levels, freezing level and terrain.







The machine is set up to give you "the bad news" first, on purpose—i.e. airports closed, NOTAMS, and hazardous weather warnings which no one in his right mind would want to fly through, so if that happens to be the story where you intend to fly, you can punch out right away and let someone else warm the chair.

The briefing I asked for was a low altitude (under 18,000 feet) flight from Houston to Forth Worth, on to Oklahoma City and finally Albuquerque. All at once the screen lights up with a series of mind-boggling pictures: present and forecast diagrams of weather activity for the entire country, followed by freezing levels and radar return maps. They are practically identical to the weather pictures you get in the real live FSS downstairs. I get as much time as I want to study each picture, and if I want a printout on paper of anything I saw, all I have to do is punch the right button on the keyboard. Any time symbols are used on the weather maps, they give you the "legend" or explanation for each symbol right at the bottom of the display (another assist to the forgetful-minded).

Electronic hand holding

Since all the data shown me indicated beautiful VFR weather to Albuquerque, I begin filling out the flight plan questions that appear next. Looking less like a gimmick and more like a real helper all the time, the machine then spews out all the appropriate NOTAMS for my flight, along with current aviation weather advisories. It also urges me to "consider the above data carefully before flying." *There it is—holding my hand again.* I promise to do as urged. Next I am shown my departure point's density altitude—wow! How many times are you offered that at a super-busy live FSS?

Now comes the sequence reports and forecasts for points along my route, covering the airspace 25 miles to either side of the route. Winds aloft pop up for eight separate points along my projected 828 nautical-mile route, with distances from the departure point included for reference.

By this time I am nearly sold, but the obliging electronic marvel goes on to ask if I would like information for any other point, on my route or not. Since a cold front is forecast to hang threateningly to the north of my flight, I check Kansas City for forecasts and sequence reports. I start to scribble some notes on K.C. weather, until I remember all I have to do is push the button for a printout. My observor smiles. I smile back.

Deciding that the flight is feasible even if the front tries an ambush along the way, I file the remainder of my flight plan when it comes my turn to talk to the machine again. It takes what I give it, and then offers me a last-minute chance to change anything on the plan, which is fully displayed on the screen. "Print it!" I say, pushing the X button, and away we go. The plan is entered into the central computer, ready to be called up by the FSS to log me on my way when I call in.

That's the process, fast and simple. It's not foolproof, no machine or process is. If a low-time VFR pilot thinks he's the greatest but isn't, or if a high-time pilot gets afflicted with get-there-itis, and they decide to go when the weather is thick enough to dish up with a spoon, no mechanical device is going to keep that pilot from making a statistic of himself. The green-faced robot will not wring its hands in despair or heave a big sigh. But then flying is for big boys—and girls.

Likewise the machine cannot keep you from fouling things up if you punch in the wrong data, such as giving your cruise speed for the 150 as 160 K. and your altitude en route as 18,000 feet. At least, not in its present form. Maybe later they will program the computer to reject erroneous data of this kind and tell you to please check your performance data in the owner's manual, or FAR such and such, or lie down and check your pulse. But not yet.

The flight I made immediately following the briefing was exactly as advertised by the machine. I was full of doubts until I saw it work. (They gave me a "live" briefing in the FSS downstairs before I left, but they didn't have anything to add or change.)

I understand that, when actually operational, the self-briefing terminal will have a direct line to a manned station, so that if I have any problems or doubts, or I get into an argument with the robot, I will be able to pick up the phone and talk to a real live specialist who will be looking at the exact same display I call up. Another big plus is the fact that the existence of numerous self-briefing terminals will free the FSS specialist for higher priority type services, like for radio contact with me when I'm tooling along upstairs and really need a quick answer or two that won't wait for the frequency to clear.

I still feel this new system harbors some of the dehumanizing effects we all get from increased automation in our lives, but I can't fault the service they give you. It's got to be better, faster and more complete and up-to-date, especially weather-wise, than the present system, because the automation will cut down on the time it takes to relay the information from sources, and the displays let you absorb the info in the shortest possible time—*and you can take it with you!* I'll never win any poker money off the green-eyed monster, but it could save my neck. If the only way to keep general aviation flying within the range of my pocketbook is to make friends with it, that's for me.

Jon Ellis
S.W. Region, FAA

Ground ICE

The ten day skiing holiday had been just about perfect—cold snappy nights and bright sunshiny days for the most part, with just enough snowfall to keep the slopes well covered. But now it was Monday morning and the pilot/skier from San Francisco was due back in his office by 9 o'clock, so he hastily dumped his skis and boots in the cabin of the Cherokee Six and began brushing snow off the wings and fuselage—until he hit solid ice. The sleek aluminum wings that had borne him up to the fantastic heights of Squaw Valley were now coated with a washboard layer of ice. How come?

The explanation was simple. The snowfall of last week had melted in the delightfully warm sunshine that followed, leaving a sodden mass that had frozen during the night into a hard, irregular coating. Insulated by a later light snowfall, the ice layer on the plane had retreated slightly, like a reluctant glacier, but still covered the cowl, most of the wing and much of the tail. And it would not come off.

The pilot came to this surprising conclusion after efforts to pull ice loose with his fingernails had drawn blood and curses to no avail. The screwdriver he found in the cockpit was only a little more effective, but it was obviously going to do more damage to the aircraft skin than to the ice.

With a nervous glance at his watch and the rising sun, the pilot/skier dashed into the airport office and blurted out his problem to the group of flyers sitting around the pot-bellied woodstove. What should he do?

"Have a cup of coffee."

"Well, thanks, but—no time. How can I get the ice off my plane?"

"Put it in a heated hangar."

"Have you got one here?"

"Nope."

"Well, what should I do? I ought to be taking off now."

"Don't."

"I've *got* to. You don't understand—my partner's supposed to start on *his* vacation this morning. There must be something I can do—?"

"Up your insurance."

This kind of advice is not helpful to the warm weather pilot who finds himself stuck with an ice machine instead of a flying machine when time is of the essence. But facts are as hard and unrelenting as the ice itself: at many general aviation airports there is literally no way of safely removing a solid coating of ice from the surface of an airplane other than to expose it to warm air, provided either by a heated hangar or by the rays of a friendly sun—usually a much longer and tantalizing process, since the fuel in the tanks which you carefully topped after landing tend to act somewhat as a refrigerant to the wind. (Engine preheaters or blow torches or other heating devices should *never* be used to remove ice, because of the danger of damaging surfaces and controls, as well as causing fire.)

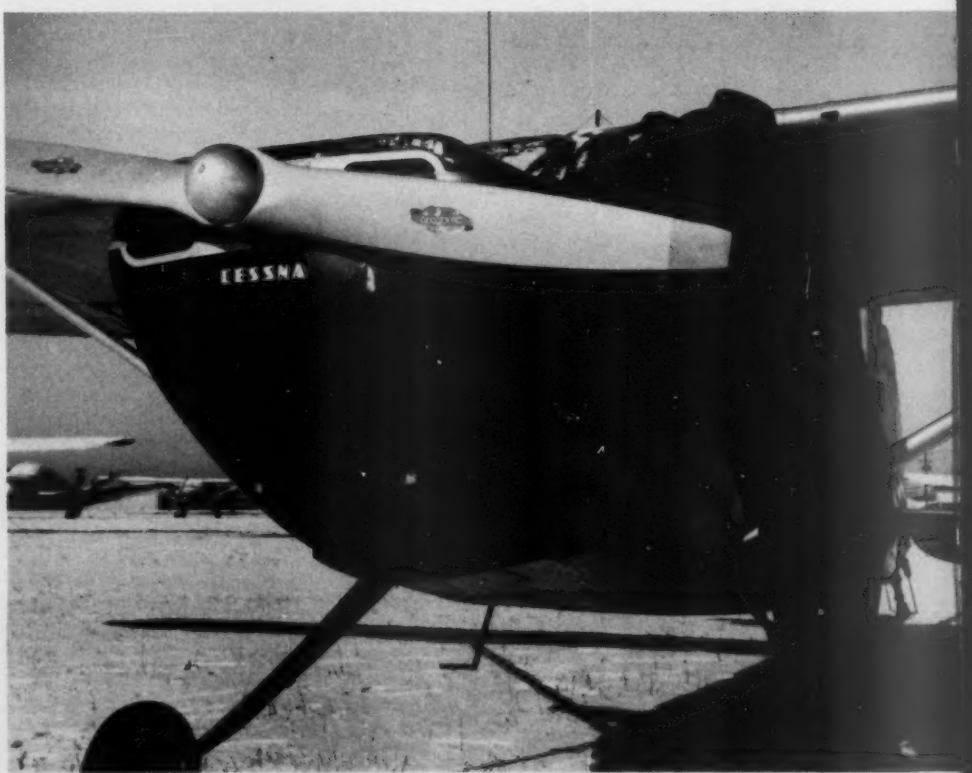
Inflight icing is a phenomenon which most pilots who have to fly IFR are familiar with. But the icing problems which arise from leaving an aircraft tied down in the open at an airport where the temperature drops well below freezing at night—such as a ski resort, a mountain hunting area, etc.—are more serious than many southland pilots expect.

Most surprising of all, perhaps, is the fact that under marginal conditions as little as a quarter of an inch of frost on the wings and tail of a light plane can mean the difference between a successful takeoff and a painful sitzmark in the snow. Frost produces an extremely rough surface, compared with the normally smooth skin of the airplane, and thereby robs it of some of its lift characteristics by disturbing the flow of air over all of the affected airfoils—the propeller as well as wings and horizontal stabilizer.

Frost or ice coating over the radio antenna, incidentally, can interfere with navigation or communication signals or block them off entirely under some circumstances. A relatively light coating of frost is all that is needed to seal off the pitot tube and static ports, rendering airspeed and other air-driven instruments inoperative. The stall warning device could be frozen in place by a very slight touch of frost. A partial ice blockage of the air scoop could have a devastating effect on available horsepower.

Even where no visible ice appears on the aircraft that has been tied down in an area of subfreezing temperatures, there is a danger that daytime thawing has melted snow or ice and allowed droplets of water to dribble into hidden crevices and hinge joints. After freezing during the night, the mobility of control surfaces or braking action could be adversely affected. The cold weather preflight should make certain that all controls have full extension range, and that the brakes are not jammed or otherwise hampered by ice. Attempting a takeoff when the wheels will not spin freely is asking for trouble.

Loss of lift is not the only problem that can be created by the presence of external ice on an aircraft. When ice lodges on (or



The plastic windscreen of an aircraft is more vulnerable to ice scrapers than the glass of a car. Approved ice removal solutions are the best means of clearing off the pilot's view.

within) a control surface which is precisely balanced, such as an aileron or tail surface, the resulting imbalance may be enough to bring about a severe vibration, or flutter, under certain conditions of flight. There have been several recent accidents of this kind involving light aircraft, where the flutter has been violent enough to cause a section of the wing to break off. Hence the importance of removing every ounce of ice from the surface before attempting to fly—only a few ounces may be sufficient to set up a dangerous flutter.

It is possible for ice to collect *inside* an aileron or other control surfaces if the drain holes become plugged. This kind of icing is very difficult to spot on a preflight check, but it is less likely to occur if the skin of the aircraft is kept clean and entirely free of ice. If a fluttter starts during the flight, reduce speed and land as soon as you can.

If the windscreen of an aircraft becomes coated with frost or ice, it should be treated with care. Aircraft windows are made of plastic, in contrast to the glass used in automobiles, and may not be chipped away at without danger of damaging the material. The type of sprays used to help remove ice from automobile window glass—usually based on isopropyl alcohol—are helpful on aircraft windscreens.

Transport aircraft that come into an airport laden with ice are often washed down with a mixture of isopropyl alcohol and glycerine ("glycol"). The alcohol lowers the freezing point of water, thereby melting the ice, and the glycerine provides a less adherent surface that discourages refreezing and encourages runoff. This operation requires large tanks and heavy equipment, not normally available at small airports.

Numerous experiments have been conducted by industry to develop a coating or paint which would repel ice formation or at least make it easier to shed ice from the surfaces of an aircraft. FAA has studied a great many of such materials, including varieties of Teflon, polyurethane, and silicone—in spray, film, paint, grease and other forms—to determine their practical value to pilots.

Aircraft surfaces were studied in a wind tunnel with simulated airspeeds of from 110 to 150 K with a temperature range from 14°F. to 25°F. Liquid water was sprayed, both intermittently and continuously, in small droplets (15 to 25 microns).

Results were largely negative. No material evaluated during the test program exhibited any anti-icing properties. Ice formation began simultaneously on both the unprotected surface and the treated area during each test run. None of the areas showed a tendency to shed ice, during or after the buildup.

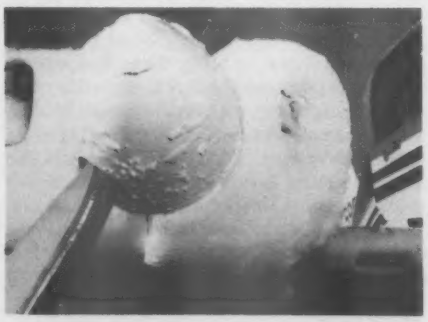
On the other hand, all of the test materials reduced the *force required to release ice* from a treated aluminum surface. The ice adhesion forces ranged from 1.8 pounds per square inch for cationic silicones to 36 pounds per square inch for polyurethane coatings. By way of comparison, the ice adhesion force for untreated aluminum surfaces is in the order of 200 pounds per square inch. Figuratively, this means that the adherent force of the ice covering a two-by-five inch patch on the wing is roughly equivalent to the force a one-ton elephant would need to adhere to the underside of an aircraft wing by the end of his trunk.

This gives a rough idea of why it is so difficult to remove ice that is solidly frozen to your airplane, and why hangaring is so desirable in cold country. As an alternative, the aircraft may be covered with canvas or plastic material. This will not always prevent some icing or frost formation, but it will stop the process of snow alternately piling up on the wing, thawing and freezing. The very least a pilot can do, if he hopes to be able to fly away home promptly when his sojourn in the north woods ends, is to brush his airplane down (gently but thoroughly) after a snowfall.

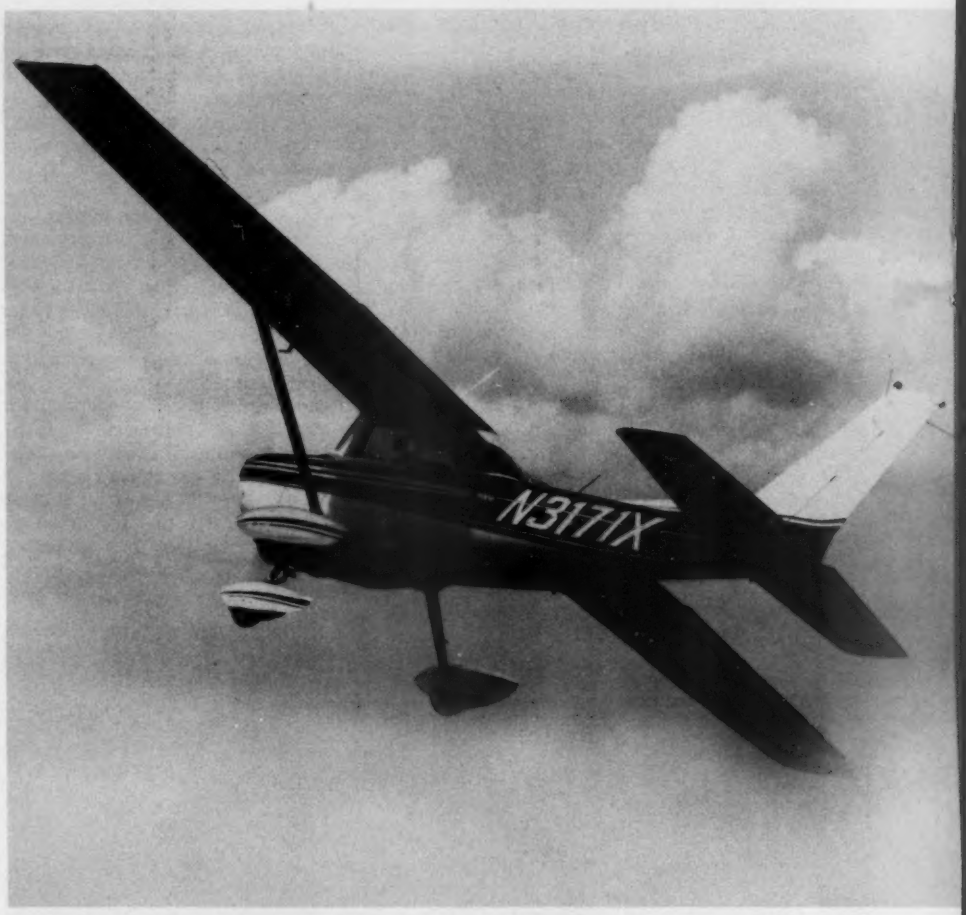
In the interests of safety he will be well advised to allow plenty of time for preflighting any aircraft that has been standing outdoors in the freezing weather, and be flexible enough to re-schedule his departure if there is hard ice or frost coating the engine, propeller, wings, windows or tail. The modern light aircraft is precisely designed to operate in its normal configuration, and any tampering with the design by the unpredictable Jack Frost could prolong your stay in his stronghold undesirably.

Snow left to accumulate on light aircraft may partially thaw by day and freeze overnight, forming a tight bond with the surface of the plane. Several hours storage in a heated hangar or a long nap in the warm sun are the only solutions to this problem.

Bottom—attempting to start up an engine in this condition could damage it severely through ice ingestion. Slight accumulations on propeller could unbalance it sufficiently to cause vibrations and internal wear. Right—surfaces of large aircraft are frequently sprayed with alcohol-base compounds to remove accumulation before takeoff.



The research report, "Investigation of Ice Accretion Characteristics of Hydrophobic Materials" (AD-712-712), is sold for $3.25 by the National Technical Information Service, Dept. of Commerce, 5285 Port Royal Road, Springfield, VA 22161.



Incident at Arcata

Caught between the weather, the mountains, the deep blue sea.

3171X calling Crescent City. I'm lost, I'm on top of some clouds and I think I'm out over the ocean somewhere.

The call was picked up at the Crescent City, Calif., Flight Service Station, late on a foggy and rainy afternoon last May.

The pilot calling in was 61 year old Robert Moist, who was flying a Cessna 150 along the Oregon-California coastline. When his call was acknowledged, he said he was trying to find Crescent City Airport to bring his plane down, and he requested a DF steer. He also stated that he was not instrument rated.

On duty at the inflight desk at the Crescent City FSS that afternoon was Mrs. Georgia Blue, a ten-year veteran FAA telecommunications specialist who just a few months previously had become the first woman to work as an FSS specialist in Crescent City. As she acknowledged the call from the Cessna, she knew that she had two immediate problems. First, there was no direction finding equipment at Crescent City. Secondly, at that very moment, shortly after three in the afternoon, the weather in the area was deteriorating rapidly, and it was hardly suitable for a landing by the lost and confused VFR pilot. Crescent City (about 15 miles south of the Oregon border) was reporting 1,000 feet overcast and two miles visibility, with light rain and fog. And continuing to deteriorate.

There was another factor uppermost in Georgia Blue's mind. The area was known for its damp climate and its sudden storms and cloud formations which could build up with astonishing quickness, and just two month previously clouds had trapped an unwary pilot who was flying up the coast from Eureka in a Cessna *Cardinal*. On that earlier flight when the *Cardinal* began to approach Crescent City in light rain and fog, the pilot kept flying out to sea to get around the weather. He was driven so far out by the clouds that by the time he turned and tried to come in to Crescent City his fuel was nearly gone. He ran out of fuel two miles out at sea and crash landed on rough waves, killing himself and a passenger on board. Remembering that earlier fatal accident, and as she talked to pilot Robert Moist out there somewhere on top of the clouds Georgia Blue knew that she had to get him in quickly.

Meanwhile, at the Arcata FSS, some 60 miles down the coastline, specialist Vernon Gary was listening to the conversation between pilot Moist and Georgia Blue. Knowing the Crescent City did not have DF equipment he broke in on the transmission and volunteered the use of the Arcata direction finder. Since the weather at Arcata, though poor and deteriorating, was still VFR, and somewhat superior to Crescent City, it was decided to bring the lost Cessna in there.

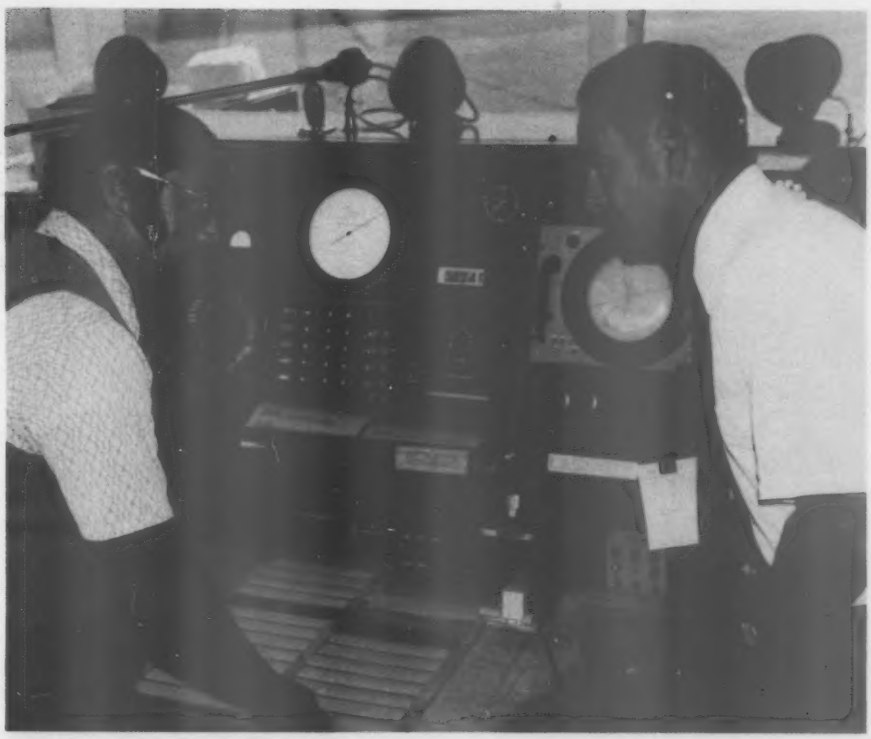
Arcata FSS had some initial difficulty in getting the bearing, which led Gray to suspect that the lost pilot was farther out to sea than he had suspected.

At this point Vernon Gray at the inflight desk at Arcata and Darrell Scheidegger at the teleprompter beside him formally took over the flight assist. Gray established voice contact with Moist in the Cessna and told him he was going to bring him into Arcata. "Stay calm, stay on this frequency and follow directions, Cessna 71 X-ray."

"Will do."

Then Gray elicited as much information as he could from Moist about the actual situation of the lost Cessna, while his partner, Scheidegger requested data on the flight plan from Crescent City to determine fuel remaining, number of occupants, and other pertinent facts.

The prelude to this dramatic flight assist had begun the previous day, on Monday, May 13, when Robert E. Moist took off in the 150 from the Sacramento Executive Airport, accompanied by his 24 year old son, John. The father and son were off on a pleasure trip in the purple and white airplane, which was owned by an aero club. They had enjoyed a number of similar pleasure trips over the years without incident, and just the previous year they had flown cross country from Sacramento to Philadelphia and back. Moist senior had been flying intermittently since 1939, but he had never received any training for an instrument rating. He spent 28 years in the Air Force as a non-flying officer, retiring with the rank of Lt. Colonel. Most recently, he had retired from the California Department of Navigation and Ocean Development. He managed to log about 50 hours a year in light aircraft.



Vernon Gray and Darrell Scheidegger at work in the Arcata Flight Service Station.

Georgia Blue at the Crescent City FSS received the first call from the lost pilot, but she had no direction-finding equipment so the assist was turned over to Arcata FSS.

John Moist, a recent college graduate, was not a rated pilot, but he had taken a weekend AOPA "pinch hitter" course, and he had passed the FAA private pilot written examination. On the cross country trip of the previous year, he had assisted his father in the cockpit by listening to weather reports and by helping with flight planning and navigation. That experience was to prove critically important during their troubled flight off the California coast in 1974.

Father and son had left Sacramento on the 13th in beautiful VFR weather, flown north via Red Bluff and Eureka, and landed at Crescent City to refuel. Then they took off for North Bend, Ore., some 110 miles away. The weather was still clear when they landed, and they hangared the Cessna after deciding to spend the night in the small picturesque coastal town.

They planned to return to Sacramento the following morning, but when they awoke on the 14th the sunny skies were gone. There was some light drizzle, some clouds, and a good deal of overcast. They were in no hurry to depart, so they decided to wait until later in the day to see what happened to the weather. Finally, after a 2:00 p.m. weather briefing, they decided they could make the flight after all.

At that moment, the weather in North Bend was reported as 1,400 scattered, 2,800 broken, 3,500 overcast, seven miles visibility, ragged ceiling, and winds at 320° at 13 knots. VFR, but not encouraging. Nevertheless, they filed a flight plan for Crescent City some 110 miles away, and took off shortly after 2:30 p.m. The takeoff was smooth and uneventful.

The weather ahead at Crescent City, 110 miles down the coastline was still less inviting: 1,000 broken, 2,000 overcast, with three miles visibility in light rain and fog. The weather enroute was VFR, but the presence of two weather systems, one at the departure airport and another at the terminal airport, constituted a potential trap for the unwary. Moist took off hoping for the best.

The Cessna flew southward along the coastline at an altitude of 2,000 feet. But as they came closer to the California border, the ceiling was beginning to come down. Growing clumps of scattered clouds along the coast had been forcing them out over the water occasionally in order to get around areas of bad visibility, so that they were now some distance from land. But Moist had picked up several radio transmissions from airplanes flying up the coast from the south, without any apparent difficulty, so he and his son felt that the weather ahead was probably better.

In order to see what lay ahead, they decided to climb above the clouds. At 10,000 feet, they found a scattered ceiling, still obscuring his view. They came back down to 5,500 feet, where they found themselves on top of a solid cloud formation. And it looked equally solid both north and south.

Moist knew he was in trouble now, and he headed back toward North Bend—too late! When he called the North Bend FSS, he was told that the airport was socked in and closed. There was no way out to the north, either. Westward lay endless miles of Pacific Ocean. To the east lay a long chain of coastal mountains, with peaks of over 10,000 feet, now shrouded with clouds—a formidable barrier to the little 150 with its 13,000 foot ceiling. There was no way to go—but down.

At 3.09 local time, Moist called the Crescent City FSS for assistance.

A half hour later the flight assist had been turned over to Gray and Scheidegger in the Arcata FSS, and the two specialists had familiarized themselves with the problem at hand. Vernon L. Gray worked the inflight desk and did most of the talking with the pilot, while Darrel E. Scheidegger beside him at the teleprompter worked right with him, discussing and plotting the assist, watching the weather, and observing the bearings, and relieved Gray when traffic became heavy in his area.

Both men had flying experience, and Gray held commercial and flight instructor certificates. Their direction finding equipment gave them a bearing on Cessna 71 X-ray, but establishing its exact position required specified turns and other procedures which the flight service station specialists felt might not be executed safely by a strictly VFR pilot like Robert Moist in his present situation. From the type of signal being received from the aircraft and from all the information they could piece together concerning the Moist flight, Gray and Scheidegger concluded that their aircraft was about 35 miles out to sea—quite a bit farther than the pilot imagined. A course to Arcata was plotted, and Moist was given a 150 degree heading. He was reminded to keep his airspeed up, wings

level, keep calm and endeavor to remain in VFR conditions.

A few minutes later Moist called in to report that clouds tops were lower now, and he thought he could descend somewhat. Gray told him to go down as far as he could, but stay clear of the clouds. *Remain VFR. Repeat, remain VFR.* Moist got the Cessna down to 3,500 feet, but that was as far as he could go. He was on top of a solid overcast.

The Cessna proceeded southeast on the 150 degree heading as Gray and Scheidegger kept talking to the pilot, reminding him to keep checking his airspeed, his heading and his altitude. John Moist, in the right hand seat, monitored the instruments, calling out the readings to his father. The airplane continued on for another ten minutes, flying at 3,500 feet, but neither Moist nor his son could see any break in the clouds beneath them. At that point, the worried pilot told Gray he felt they should declare an official emergency.

At 4:51 Arcata then notified the Oakland Center, and an emergency altitude block was immediately put into effect. The FSS at Arcata was given control of all altitudes below 4,000 feet in the airspace required for the emergency descent of Cessna 71 X-ray. That eliminated the problem of air traffic separation with IFR aircraft in the area.

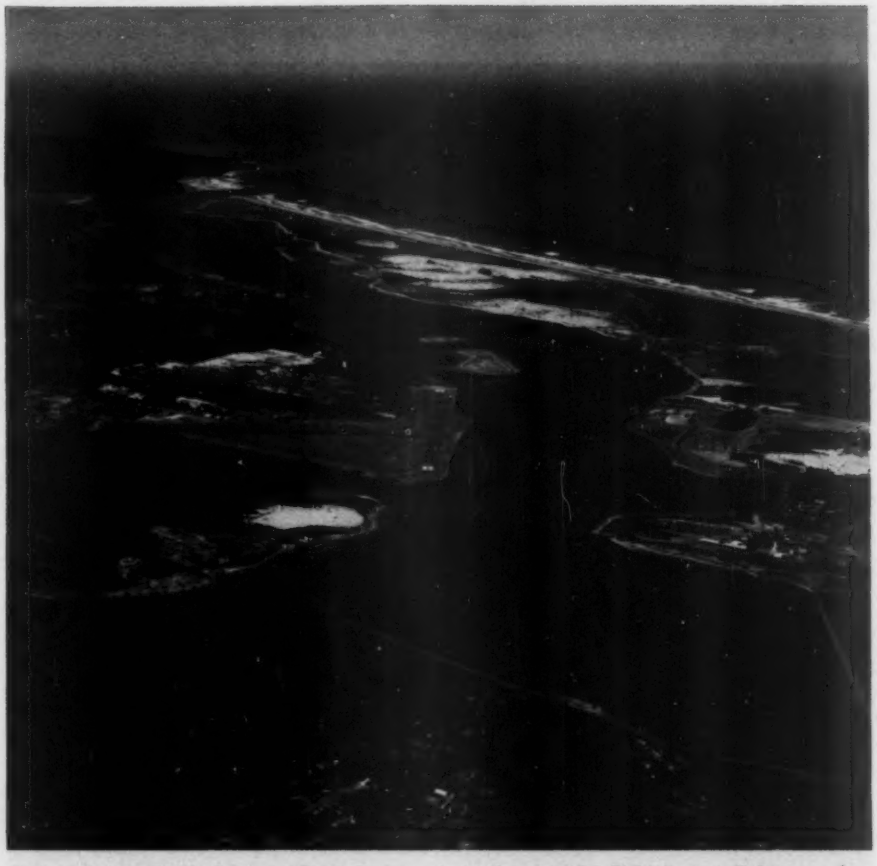
But the basic problem remained: they still had to get a VFR pilot down through the clouds, fog and rain. The FSS at Arcata is situated in the control tower building, and as Gray and Scheidegger looked out the windows they could see that the weather was worsening quite rapidly now. The sky was completely obscured, and visibility was down to one and one-half miles. There was light rain, fog clouds, and an indefinite ceiling of only 400 feet.

The two men in the FSS knew that it was now or never for 71 X-ray. In a matter of minutes the airport would be completely socked in. It would be difficult enough to get Moist down through the clouds, but if the VFR pilot had to make an instrument landing instead of a visual approach, his chances of landing safely would be slim. They had to get him down under that 400 foot ceiling right now before it came down any further.

Taking a deep breath, Gray gave Moist a heading of 105 degrees, and advised him to start a gradual descent through the clouds. ". . . suggest you use about 20 degrees of flaps, hold your airspeed steady and keep your wings level. Not too fast, now, and not too slow. I'll be with you all the way."

Moist established his descent at 65 mph and he asked his son to let him know immediately if the airspeed varied significantly.

They entered the clouds. Moist was a little tense, remembering statistics he had read of how few non-instrument pilots survive more than a few minutes after entering instrument conditions. His eyes were straining for a glimpse of land or sea below.



Above—North Bend, Ore., on Coos Bay is where the eventful flight began. Below—a simple frame building houses the Flight Service Station at Crescent City, the destination.

Despite the steady reassurance of Gray's voice on the radio, the pilot found himself experiencing some dizziness as the airplane slid down through the clouds. "*—we're spinning, I think!—*"

Gray told him quickly to release the controls and the airplane would right itself. *Okay*, Moist reported, *we do not seem to be spinning now*. The descent through dense clouds continued—3,000 feet. Now 2,500. Now 2,000. And they were still in the clouds.

At 1,800 feet there was a sudden break in the ceiling, and they could see the water beneath them. Moist had been concerned about the aircraft's attitude when they broke out, and he had asked his son to make sure he did not react in the wrong direction. But that is exactly what Moist did, he emerged from the clouds in a gentle left spiral of about 20 to 30 degrees, and mistakenly steepened his bank.

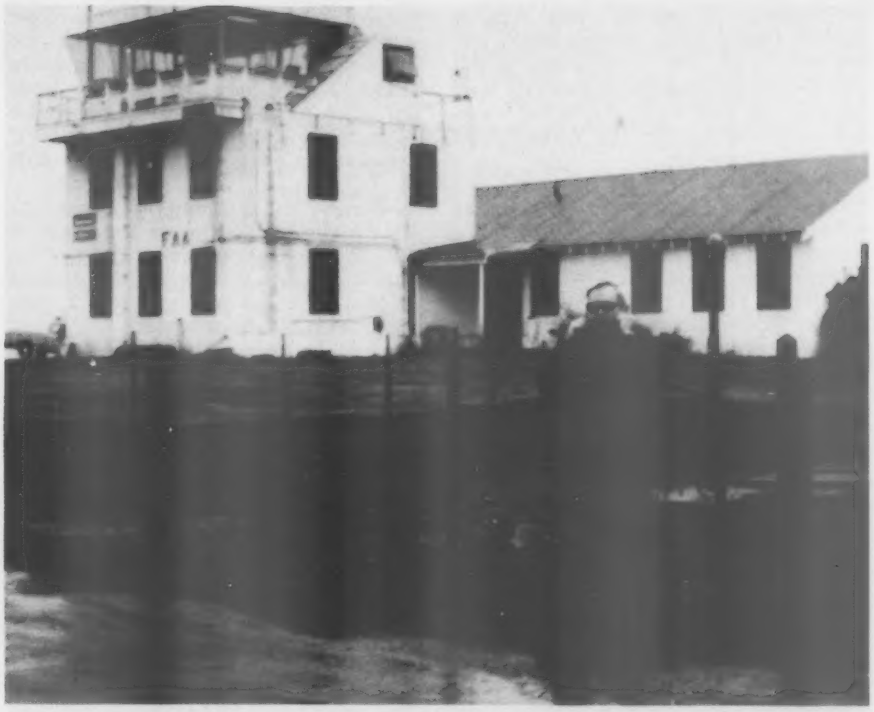
"The other way, Dad."

Moist senior brought the plane smoothly back under control, and reported his situation to Arcata.

Gray told him to maintain visual contact with the water at 1,800 feet, and gave him a heading of 270 degrees toward a position west of the Arcata Airport. Moist now found himself flying through scattered clouds, and having some trouble maintaining visual contact with the water beneath him, and he was feeling uneasy again.

Descend to 1,000 feet, Gray advised him.

The Cessna 150 descended to 1,000 feet, but in the rain and fog, Moist and his son



A grateful Bob Moist visiting the Arcata FSS after the assist, made some safety resolutions.

were still not certain they could see the water below, and they were worried about running into the headland at Rocky Point, which jutted out to sea just north of Arcata.

Descend to 400 feet, Gray advised. Try to get under the ceiling. You are still over water, so let's get her down now. Just keep coming down gradually. And watch your heading.

"All right . . . all right. We're coming down. Still pretty thick up here."

"71 X-ray, keep watching your altimeter. You don't want to get down much under 300 feet."

"Okay, my son is watching it."

There was a brief, worrisome moment of silence on the radio, and then Moist called in excitedly, "Okay! we're out of it. We're over the water."

"That's fine. 71 X-ray, what is your altitude now?"

"We're down to two fifty."

"71 X-ray, all right, now see if you can stay up at about 300 feet until you have the airport in sight. If you take up a heading of 190 degrees—one nine zero—you should be lined up for Runway one nine. We're practically on the beach."

Moist climbed back up to 300 feet, and at exactly 5:19 p.m. he excitedly reported to Gray that he had spotted the beach and the airport. Gray and Scheidegger in the FSS had also spotted that purple and white Cessna coming in through the rain and the fog, and they gave a great sigh of relief. The landing was now routine. Gray gave Moist the wind speed and direction, and three minutes later the airplane was on the ground.

Just 20 minutes after the landing, the overcast was practically down to the surface, and Arcata Airport closed for the day. The weather had been cheated of another victim—barely.

The episode at Arcata that day is officially listed by FAA as an assist by the Flight Service Station, but Bob Moist says that as far as he is concerned, Gray and Scheidegger saved his life and his son's. Had he not been coaxed down through the clouds by the FSS specialists, he probably would have run out of fuel waiting for the weather to clear. And had the 150 gone down in the ocean, locating survivors would have been difficult, if not impossible, in that weather.

For their part in the assist, Vernon Gray and Darrel Scheidegger were flown to Washington, D.C., on December 4, 1974, and presented with FAA's annual Award for an Outstanding Flight Assist. The Award carried a cash prize of $400 each. Gray, who has three married daughters, and Scheidegger, who has four young children, both say that what they did last May 14th was strictly in the line of duty for an FSS specialist—but they certainly do appreciate the money.

As for Bob Moist, after a good night's sleep, he and his son climbed back into the Cessna and continued their flight home to Sacramento—after a careful weather briefing. The sun was shining at Arcata that morning, but they were taking no more chances with that unpredictable coastline.

In fact, before he left Arcata, Pilot Moist made several resolutions that would affect his future flying. These included a decision to:

1. Never again try to overclimb the clouds.
2. Never again let his normal optimism spill over into weather considerations. In other words, expect—and be prepared for—things to get worse, not better.
3. Get that long-delayed instrument training.

Co-pilot and son John Moist unloading the 150 at journey's end at Sacramento airport.

FAA ANNUAL AWARDS FOR OUTSTANDING FLIGHT ASSISTS

In addition to the award given to Gray and Scheidegger of the Arcata FSS, similar awards were presented on December 4 to:

Richard C. Gardner III, of the Tallahassee, Fla., Tower, who on December 20, 1973, brought down a pilot who was caught in deteriorating weather at night with only ten minutes of fuel remaining.

Charles R. Bliss of the FSS in Kenai, Alaska, who on August 22, 1973, brought down a passenger who had to take over the controls when the pilot suffered a fatal heart attack in the seat beside him.

Over the past several weeks 165,000 owners of 195,000 general aviation aircraft have received a notice issued by FAA's central region requiring that, within ten hours of service time after December 5, 1974, the part and serial number of their altimeter be checked. If the instrument falls within a specified category the aircraft must be placarded, "Aircraft Approved For Day VFR Flight Only." (Aircraft with more than one operative altimeter are exempted.) On or before November 30, 1976, the affected altimeters must be replaced with approved equipment, or modified in accordance with the manufacturer's instructions. When this is done the placard may be removed.

This type of FAA notice is called an Airworthiness Directive (AD). Unlike an advisory circular, AD's are *mandatory*, and are published in the Federal Register as an official amendment to the Federal Aviation Regulations. As such they form a permanent part of the airworthiness data for the affected aircraft.

Many pilots think of airworthiness only as a form of FAA certification which every aircraft must undergo before it is delivered to a customer. But that certificate is only the beginning of the program of world-wide, lifelong safety surveillance maintained by FAA.

When an "aeronautical product" (an aircraft or any of its components) is new, engineers rely upon past history of similar products or analyses to predict its reliability and longevity. But as service time is accumulated, they may have to revise their predictions. They may shorten the estimated usable life of a part, or they may determine that a particular part or installation design is unsafe, and require immediate or near-term replacement, or modification. When flight safety may be jeopardized FAA will issue an Airworthiness Directive either by mail or telegraph (depending upon the urgency) to the registered owners of all affected aircraft requiring mandatory action.

A mechanical failure in approved aeronautical products which may surface first in South Dakota or western Africa could be an early warning of trouble brewing for thousands of general aviation aircraft all over the nation. The altimeter example cited above originated in FAA's European region, after two incidents of jammed altimeters were reported last June involving Piper and Cessna aircraft in Sweden. Following these reports, FAA began a "limited directed safety investigation," and 43 repair stations around the country were contacted for additional information.

It was determined that jamming had occurred as a result of teflon bearing material, glued on certain metal assemblies in the altimeter, coming unglued, falling into the gear mechanism and jamming it. The potential hazard was identified in some 72,000 altimeters, manufactured since 1969 and installed in virtually every type of modern aircraft. Their previous service record was "clean," but in September of this year two more incidents of jamming were reported, this time within the United States, and on November 19 the Airworthiness Directive was issued.

Tracking down the aircraft exposed to a design or mechanical hazard is often an arduous and time-consuming task. When the problem first surfaces it may be difficult to determine the actual cause—whether there is a design fault, an installation error, or perhaps an operational overstress. Recently in FAA's southern region, a mechanic was checking the outerwing panel of a light twin for cable alignment. Looking through the inspection plate, he was surprised to see obvious cracks in the flange around a "lightening" hole in the outer spar. He was unable to relate the cracks to any known usage of the airplane, so he called them to the attention of the local FAA Engineering and Manufacturing District inspector.

An investigation was begun in the region with the assistance of the Maintenance Analysis Center and the cooperation of the manufacturer. The problem was an enigmatic one, as such cracks were found in a small number of this type of aircraft with unrelated service experience. Eventually the investigative trail led to a particular worker at the assembly plant, who apparently had bent the flange to the wrong side in a number of assemblies and not recognizing the significance of the error had simply re-bent the metal in the opposite direction, thus weakening it to the point where it would crack readily and degrade the strength of the wing spar. Once the detective work had been completed, an Airworthiness Directive was promptly issued to the owners of all aircraft produced in that assembly unit within a given period, requiring inspection and where necessary repair of the spar.

Many non-owner pilots have the impression that AD notes are something the *owner* or *operator* must be concerned with, not the pilot. But Federal Aviation Regulation 91.163(a) states that, "The owner *or* operator of an aircraft is *primarily* responsible for maintaining that aircraft in an airworthy condition, including compliance with Part 39. . . ."

All right, but supposing the operator is not the pilot? Under many conditions of flight operation, the official operator of the aircraft may not even be on board. Does the pilot have any responsibility for compliance with ADs in such cases?

Indeed he does. Part 39.3 states that, "No person may operate a product to which an airworthiness directive applies except in accordance with the requirements of that airworthiness directive." So the pilot does have some responsibility here.

It should be borne in mind that an Airworthiness Directive does not actually require action on the part of anyone. Rather, it requires a specified action *before the aircraft is operated within a specified period.* As long as the plane sits still, nothing need be done. But when a pilot takes an aircraft, for which ADs have been issued but not complied with up in the air, at that point precisely a violation of the FARs may occur.

How does the pilot, if he is neither owner nor the operator of an aircraft, know about AD compliance? The maintenance records of the aircraft, if properly kept up, will tell him which ADs have been complied with and in which way. But it will not tell him about the ADs which may have been issued and not complied with. How can he learn about these?

FAA publishes a summary of all ADs every two years, in two volumes, covering small (under 12,500 lbs.) and large aircraft respectively. Purchasers of either volume also receive a bi-weekly listing of all airworthiness directives which have been issued since the summary was published. A

pilot can ask to look at these notes at any FAA field office, or at an approved repair station. Or, of course, he can subscribe to the publication. Another alternative would be for him to check with the registered owner of the aircraft periodically, since FAA sends AD notes directly to all owners. They are also published in the Federal Register, but this is not a publication many pilots study on a daily basis.

The means by which a pilot keeps himself informed on AD notes that pertain to the aircraft he flies is not important; what counts is the fact that the information is available, and that he is expected to know about ADs and to take reasonable measures to make certain that he does not, in violation of FAR 39, operate an aircraft except in accordance with all pertinent Airworthiness Directives.

Above—AD 74-24-13 requires that serial numbers of aircraft altimeters be checked (by examining the instrument or the aircraft logbook) to identify those suspected of defect. Below—sometimes a routine inspection reveals a condition serious enough to be the subject of an AD note.

What about the operator, who may or may not be flying the airplane? What are his responsibilities in this matter?

His responsibilities depend upon the arrangements under which he has leased, rented or otherwise acquired control of an aircraft. He may arrange with the owner for the latter to carry out all Airworthiness Directives. Or he may arrange to carry them out himself. In this case, he would probably have the registered owner insert the operator's name in the Lessee/Operator block of the Aircraft Registration form (AC Form 8050-73). This form is mailed by FAA's Aircraft Registry to the legal owner of the aircraft annually, shortly after the first of January AD's are mailed to owner and lessee operator when his name and address are known.

Here again, the means by which the operator keeps himself informed on ADs is at his own option, but he must make a reasonable effort to ascertain that the ADs are carried out in the manner prescribed and not to engage in flight operations contrary to the provisions of applicable ADs.

What is the owner's role?

The owner may not use his aircraft, or knowingly allow it to be used by others, except in compliance with ADs which have been issued. This responsibility includes prompt notification to FAA of changes of address. If he leases out the aircraft or allows another person to maintain it, he must take effective steps to assure compliance with ADs. He cannot simply assume that others will take over the burden of maintenance automatically. The situation may call for a written agreement, or perhaps an oral one, depending on circumstances. But there should be no ambiguity as to who will take the necessary responsive action to ADs.

The role of the mechanic or repair station owner, with regard to AD compliance, should also be clearly understood. Some owners are under the impression that when they take their aircraft into the shop for an annual or 100 hour inspection, or a progressive inspection, the maintenance mechanic will routinely ensure that all AD notes in effect are complied with before he signs off on the inspection. This is not necessarily true. Some ADs in effect may deal with components which are not normally part of the inspection, such as radios. Also, some ADs already in effect at the time of the inspection may have delayed compliance dates; in such cases the mechanic is not obliged to act upon them, and may not do so unless requested by the owner or operator.

Whenever an AD has been complied with by a mechanic, he should not only record the date of compliance and time in service in the aircraft maintenance records, but also furnish a description of the work done—several alternative methods of compliance may be possible, and at some later date it may be important to know which route was followed. When the aircraft goes back into service, whoever accepts the plane from the shop should make it his business to see that the maintenance record, including AD notes, is fully up to date before operating it.

So—the responsibility for compliance with ADs cannot be disclaimed by any of the parties involved in its operation or maintenance, be he mechanic, owner, operator or pilot. All have some degree of responsibility, depending always upon the circumstances under which the aircraft is utilized; all are expected to know about the procedures for issuing ADs, and to understand their role in compliance. Assuming that "the other guy" has taken care of this aspect of an aircraft's airworthiness condition is an open invitation to trouble.

(Editor's note: The foregoing discussion is concerned with the intent of the Federal Aviation Regulations with regard to airworthiness, and does not apply to legal liabilities which would be determined in a court of law.)

Ferry Flights and AD Compliance

If an Airworthiness Directive requires compliance before further flight and does not have a provision for the issuance of special flight permits, a special flight permit will not be issued and the affected aircraft may not be flown to a repair station.

If the AD covers a product which is not an aircraft, and does not provide for the product's operation during a ferry flight under FAR 21.197, the product may not be operated during such a flight. If the aircraft on which the product is installed can be safely operated without using the product, a special flight permit could be issued. Consult an FAA District Office Engineering Inspector.

Airworthiness Directives for General Aviation

The Summary of Airworthiness Directives, Volume I (Small Aircraft) is available for $6.95 ($8.69 foreign) at the following address:

DOT/FAA
Aeronautical Center, Attn: AAC-23
P.O. Box 25461
Oklahoma City, OK 73125

Purchase of a Summary entitles you to receive bi-weekly listings of all such directives published for a two year period commencing with the publication date of the Summary.

All correspondence concerning AD summaries, including changes of address and requests for supplements which failed to arrive as scheduled, should be addressed to the Aeronautical Center, Distribution Section AAC-45C at P.O. Box 25082. Enclose a mailing label from a recent bi-weekly issue, or print the name, address and computer identification number as they appear on the label.

A free Advisory Circular on this subject, "Airworthiness Directives for General Aviation Aircraft" (AC 43-5) is available from the Publication Section, TAD 443.1, Washington, D.C. 20590.

This is the season of diminished use for most general aviation aircraft—many of them are allowed to enjoy a long winter nap. But unless they are prepared properly for this period of hibernation they may emerge much the worse for it. Bedding the bird down is not merely a matter of covering external parts with a tarpaulin or finding a dry corner of a hangar. The enemy attacks silently from within.

If you are buying a second-hand aircraft, the one to be leary of is the bright, shiny, obviously little-used airplane owned by a busy professional who just never had time to get out to the airport more than half a dozen times since he purchased it. The cabin may look and smell factory-new, but the engine and many of the working parts may be prematurely aged. Manufacturers tell us that engines in infrequently flown aircraft have a shorter life expectancy than those used regularly. In fact, Lycoming states flatly that unless its engines are flown at least 20 or 30 hours a month they may not achieve the normal time-between-overhauls life.

The reason? In a word, *rust*. In use, aircraft engines are said to be "self-purging"—the heat of normal operating temperatures cooks away moisture in and around the engine, and internal moving parts are lubricated with oil which forms a protective coating on cylinder walls, piston domes, etc. (It takes about 50 hours to build up this protective coating, which is why new engines are especially vulnerable to corrosion: they may accumulate rust in the cylinders after just a few days of inactivity in humid areas.)

In non-use, oil is drained away by gravity from surfaces, and moisture in the air may condense on them, leading to corrosion. Even the airframe has many movable parts (hinges, cables, pulley block, etc.) which are more susceptible to rust and/or corrosion when the airplane is idle for a long period, and it accumulates moisture-inviting dust and grime, which would be dislodged during regular flight activity.

Sneaky assailant

The sad part of internal corrosion is that it can sneak up on you with no external indications until long after serious damage has been done to the aircraft. One fine day your mechanic informs you, after running a routine compression check on your 600 hour engine, that a top overhaul is in order, even though the authorized time between overhauls for that particular beast is 1,400 hours. Then it's too late to do anything about it, but dig in your pocket and groan.

It follows that an orderly procedure for protecting our aircraft during idle periods should be adopted by every concerned pilot/owner, aided where necessary by a certificated mechanic. Procedures differ according to whether it is to be used infrequently—several times a month—or whether you are not planning to use it at all.

If weather or some other factor keeps you from flying for a week or more, you should give your airplane the courtesy of a weekly visit anyway—or designate someone else to do it. (If you can ask friends to look after your animals, feed the fish or water the plants in your absence, does your aircraft deserve less?) Every five to seven days you should turn the prop, with the switch off, half a dozen times; this will spread oil around the cylinder walls and dispel any beads of moisture that may have accumulated. For this purpose, ground running the engine is not as good as turning the prop by hand. If you fire it up, but do not run it long enough, it could just make matters worse by introducing additional moisture into the system or turning moisture already in the oil to harmful acids. If it is run too long on the ground, on the other hand, it could produce harmful side effects, such as hot spots in the cylinders, "baking" of the ignition harness, etc.

However, simply rotating the prop every few days will not protect your engine indefinitely. After a month of inactivity the airplane *should* be run. The best way is to fly the plane for half hour or so; this not only lubricates the engine thoroughly and evaporates moisture, but it also frees up the moving parts of the engine and of all other parts of the plane, and helps recharge the battery. If it is impossible to fly, a cautiously performed ground runup should be made. Lycoming recommends bringing the oil temperature to within the lower green arc range; Continental suggests bringing oil and cylinder temperatures up to, but not above, the normal operating range.

(For inactive periods of more than a week Continental recommends that the oil be drained and replaced with corrosion protective oil such as MIL-C-6529, Type II.)

Inactive Aircraft Storage

If you know that your aircraft is to be inactive for more than 30 days, then it should be prepared for temporary storage—especially if you are located in a humid climate or near salt water. Your manufacturer's specific directions should always be followed, but preparation for storage generally includes draining the regular oil (preferably just after flying, because it drains better when warm) and replacing with a preservation lubrication oil (your aircraft maintenance manual or engine handbook should tell what type to use). The engine is then run up to normal operating temperatures and shut down. The airplane should be moved into the hangar or wherever it is to be stored, and the preservative oil drained. (It can be saved and re-used.) Remove sparkplugs and spray the interior of each cylinder with corrosion-preventive oil, first while rotating the crankshaft, and again with the crankshaft stationery. The plugs are then replaced, or special dehydrator plugs are substituted. The crankshaft should not be turned after this point, so hang a sign on the prop: "Do not turn prop—engine preserved."

Dehydrator plugs fit into the spark plug opening, but are made of clear plastic

A snug tarpaulin and stout tie-downs are essential for outdoor storage, but prolonged inactivity calls for special protective measures for the engine.

In preparing an engine for storage the first step is to spray preservative oil through the spark plug holes of each cylinder.

Above—for indefinite storage, dehydrator plugs are installed in spark plug holes after cylinders have been sprayed. Below—desiccant bags are placed in exhaust pipes and other openings which are then sealed with waterproof tape. *Photos courtesy of Teledyne.*

within which is silica gel treated with cobalt chloride. This substance remains bright blue in dry air, but as humidity increases the color turns to lighter blue, then lavendar pink and finally white. Blue or lavendar indicates the air is dry enough to resist corrosion (no more than 30% relative humidity). These plugs enable an exterior inspection to disclose when a dangerous moisture level has been reached inside the cylinders. Other engine parts should be given the protection specified by the manufacturer.

Corrosion-preventive compounds are petroleum base products which form a wax-like film over the metal. There are several types of corrosion-preventive compounds made to fit the various aviation needs. They vary from a light compound that blends with engine oil when warm, to a heavy compound used for dip-treating metal parts. *It is very important that the proper compound be used, so check the manufacturer's recommendations carefully.* Some compounds come in Type I, II, and III—be sure to read the label with care.

If you know in advance that you will not be flying your aircraft for at least several months, then it should be prepared for *Indefinite Storage.* The procedure is somewhat similar to that for inactive storage but more extensive and requires the services of a certificated mechanic. Under some conditions it is advisable to remove the engine and seal it in an airtight container for protection from moisture. Much wider use of dessicants (dehydrating agents) is made.

Following either inactive or indefinite storage the preservative oil should be drained and the proper grade of oil installed. Always follow procedures recommended by the manufacturer. All seals, tape, paper and streamers should be removed, and sparkplugs replaced.

Although the engine may be the single most important and expensive component, the rest of your airplane should not be neglected when you make your weekly visit, in person or by proxy, to pull the prop through. For example, tires that are allowed to lose pressure may be damaged by the weight of the aircraft. In fact, it is a good idea to move the wheels slightly or rotate them, in order to prevent flat-spotting, which could give you a rough ground roll next Spring. Other items that are sometimes overlooked, especially when the aircraft is parked outside, include:

- **The battery.** An uncharged battery is very susceptible to cold weather damage. Removing it to a warm, dry shelter will probably save you time and money in the long run, if you are not flying much through the winter.
- **Tie-downs.** See that ropes have not developed too much slack (or been cut by malicious pranksters), and chocks are in place. Leaving aircraft brakes on while parked is not recommended—a bad freeze could lock the wheels. If a severe storm is headed your way, you can increase the security of your soft field tie-down by digging saucer-like depressions for the wheels. Also, double check to see that you have followed the manufacturer's instructions with regard to flap position when parked outside.
- **After a snowfall.** Brush the aircraft clean, or have someone do it for you as soon as possible. Dry snow comes off easily; refrozen ice can be murder. An unchecked accumulation of heavy wet snow on the wing could damage it through overstressing. Spraying beforehand with an anti-icing solution may help, but be cautious about using chemicals on plastic windshields unless they are specifically recommended for the purpose.
- **Engine orifices.** Covers should be placed on all openings to the engine, including the air intake, exhaust pipes, and pitot tube. Bright colored signal streamers on such covers help prevent your forgetting to remove them the next time you attempt to take off.
- **Control locks.** Make sure they are all still securely in place.
- **Drain holes.** See that they have not become clogged up or iced over. Blowing snow or rain can be driven inside the "skin," and eventually affect the trim of your aircraft seriously, if not allowed to drain free. This also increases the hazard of internal corrosion, rot and mildew.

It sounds like a lot of work for you to do while the object of your attention is doing nothing for you. But what it really amounts to is having a simple "between flights" check list, which turns out to be a low-cost form of insuring that when your little bird comes out of cold storage it will not be a dead duck.

Famous
Flights

Airship Pilot No.1

"Uncle" Tom Baldwin, the greatest aerial showman of his time.

Tom Baldwin "stole the show" at the St. Louis Fair in 1904 when his airship, the *California Arrow*, circled gracefully overhead.

The name of Thomas Scott Baldwin does not conjure up reminiscences of grandeur among many aviation devotees in our day, but in his own day, at the turn of the century, Baldwin was much better known than the Wright brothers. He was not only a pilot and aircraft designer, but also a balloonist parachutist and airship builder with a world wide reputation as the foremost "aerialist" of his day.

The son of a physician, he was born in Palmyra, Mo., on June 30, 1854. Both of his parents were killed during Civil War raids, and the boy was forced to leave school at an early age and make his own way in the world. He became a newspaper boy, a street-lamp lighter and a traveling book salesman. A chance meeting with a circus performer in Hot Springs, Ark., led to a new career on the flying trapeze and tight wire, performed in the open streets, with the wire stretched over building roofs. By the time he was 19 he was walking back and forth on a 700 foot wire stretched over the Pacific Ocean from Cliff House to the Seal Rocks, 100 feet in the air.

Soon he added an ascent in a hot-air balloon to his act, and then a descent from the balloon with a parachute. In 1887 he parachuted out of his balloon from a height of 1,000 feet over Golden Gate Park in San Francisco before 30,000 onlookers. This stunt was financed by the local street car company which paid him a dollar a foot.

A few months later he made a jump from 4,500 feet over Quincy, Ill., again using a balloon as his jumping platform. The townspeople presented him with a large gold medal encrusted with six half-carat diamonds, and a purse of $500. Baldwin did not invent the parachute he used, as some people imagined, but he did modify it, essentially by removing an 18-inch circular section from the crown, which improved the stability of the chute tremendously. He also improvised a ringed skirt at the top of the chute, which could be maneuvered for directional control.

After building up his reputation as a high flyer in this country, Baldwin packed up his balloon and parachute and embarked on a triumphant tour around the world, starting in England, where he earned over $80,000 in a matter of weeks with his death-defying leaps—plus a diamond ring and a commendation from the Prince of Wales. He traveled on to the continent, soared over the Eiffel Tower in France, over Mt. Vesuvius in Italy, a cathedral in Spain, a palace moat in Tokyo, a temple in Siam, a beach in Australia. He traveled twice around the world, visiting all the continents and most of the large cities, and returned in 1891 with an enormous booty of cash and gifts.

Back in the United States, where he was now a celebrity, "Uncle Tom" as he became known, set up a training school for balloonists and parachutists. He retired from active jumping in 1897, after 800 leaps without serious injury. In the year 1900 he settled in San Jose, Cal., where he designed and constructed an airship, incorporating many of the ideas he had picked up from aviation pioneers on his world tours.

Baldwin's airships were essentially sausage-shaped, hydrogen filled balloons with an open framework suspended below, supporting the propeller, motor, and pilot. His first effort, powered by a bicyclist, failed to get off the ground but Baldwin persevered, supporting his venture by giving people exciting rides in a captive balloon at a dollar a head. In 1904 he completed a gasoline-powered airship, the *California Arrow*, which was successfully flown for him at the St. Louis World Fair Balloon Exposition by a slender pilot named Roy Knabenshue (at 200 lbs., Baldwin exceeded the lift capacity of his ship).

An outstanding feature of the St. Louis Fair was an international airship exhibition, which included a $25,000 prize competition for controlled flight. Baldwin's *Arrow* outclassed all other entries, foreign and domestic, accomplishing the first cross-country circular flight by a powered aircraft in the United States. His success at St. Louis earned Baldwin a new international reputation as an aeronaut, and he was presented with Airship Pilot License No. 1 by the International Aeronautic Federation. At the same time he was awarded a contract by the United States Army for the first American military airship, the SC-1 (Signal Corp No. 1).

The engine for the *Arrow* had been built by a motorcycle racer and engine-maker from Hammondsport, N. Y., named Glenn Curtiss. Baldwin was so impressed with his younger colleague that he moved to Hammondsport in order to coordinate their labors on the Army contract.

Specifications for the SC-1 called for an airship capable of carrying two persons plus a payload of 150 lbs. and fuel for two hours cruise at a topspeed of 20 mph. The 20,000 cu. ft. capacity gasbag was to be 96 feet long and 18 feet in diameter, with a 60 foot open spruce framework serving as the fuselage. Control surfaces included elevators forward and a double rudder aft. Power was provided by a 20 hp aircooled Curtiss engine, turning a ten-foot wooden propeller.

The SC-1 was accepted by the Army on August 22, 1908, after successful tests at Fort Myers, Va., with Baldwin as pilot and Curtiss as engineer. Baldwin continued his work on airships for several years but his market disappeared as the Army and the public lost interest, despite his many successful demonstrations. In Europe, over the next decade the German-built Zeppelin dirigibles enjoyed a tremendous vogue as the first successful form of commercial air transport. Rigid airships over 400 feet long carried over 30,000 passengers some 100,000 miles without injury, and the German High Command was able to enter World War I with a

superior long-range aerial bombing capability. But in America, Baldwin's well-functioning airships were regarded as little more than curiosities.

In 1907 Baldwin had turned his attention to fixed-wing aircraft, becoming a member, along with Curtiss, of the elite "Aerial Experiment Association" financed by Alexander Graham Bell for the purpose of producing new aircraft. The only experienced pilot in the group, Baldwin designed and built a biplane with a 31-foot wingspread, powered by a four cylinder 24 hp engine (Curtiss, naturally). One of the "advanced features" of his *White Wing* was the trailing-edge aileron. He taught Curtiss to fly in the *White Wing*, and his former engineer went on to build and fly his own *June Bug*, an aircraft similar in many ways to Baldwin's plane, but favored with a much stronger 40 hp V-eight engine. Success of the *June Bug* launched Curtiss on his meteoric rise as the foremost builder of aircraft in America during World War I.

Baldwin continued his interest in airplanes, but at heart he remained a lighter-than-air man, and he toured around the world thrilling the public with airshows. The onset of World War I finally stirred up the Navy to call upon him to design an airship for them. Later in the war he served as chief of the Balloon Section of the Signal Corps. and finally as chief of balloon production for Goodyear in Akron, Ohio, birthplace of the famous "blimps."

By the time he died, in 1923, heavier-than-air craft were clearly dominating the aviation scene, and few persons remembered the exciting moments of the St. Louis Fair, nearly a quarter of a century earlier, when a flambouyant young Missourian had blazed a new pioneering trail in the sky. Perhaps if enough backers had been found for a commercial airship transportation system . . . or if Baldwin had followed up his successful *White Wing* with the same ardor he displayed toward lighter-than-air craft . . . perhaps he might have won a place in the front rank of aviation pioneers. There is no question that he had the courage, the imagination, and the inventiveness of mind.

But the spotlight of history moved away from him, and his name remains in the shadows.

During a lull in the airship business Baldwin built his own airplane, the *White Wing*, forerunner of the Glenn Curtiss *June Bug*.

BRIEFS

■ COLD FACTS FOR MAINTENANCE PERSONNEL: To guard against chill winds and temperatures it is advisable to wear heavy, non-static clothes. Static electricity can be generated while wearing synthetic clothing such as a nylon jacket. Remember also that touching bare skin to cold metal surfaces can flash-freeze skin and cause it to stick to that surface, so wear gloves. Avoid prop blast when working on the line in cold weather--a dangerous chill factor could develop.

■ ATTENTION ALL PILOTS: If you have not satisfactorily completed a "biennial flight review" (and been signed off by an instructor) you are not now considered a "current" pilot and may not act as pilot in command until you complete the flight review. Some pilots have been under the mistaken impression that they could fly solo without having their flight review. The biennial flight review requirement--unlike some other currency requirements--pertains to flying alone as well as with passengers.

■ PLANNING AN AIRPORT? A newly revised FAA Advisory Circular provides guidance to sponsors of airport system plans and airport master plans on how to participate in FAA's Planning Grant Program. The book describes the application process and administrative procedures to be followed in performing planning projects. AC 150/5900-1A, "The Planning Grant Program for Airports" is available free from DOT/FAA Publications Section, TAD 443.1, Washington, D. C. 20590.

■ BAHAMAS-BOUND PILOTS, take note: For a copy of "The Bahamas Flight Planner" write Bahamas Tourist Office, 200 S.E. First St., Miami, 33131. The brochure contains miscellaneous facts about touring the Bahamas by air and a map of the islands noting airports, radio facilities and available accommodations.

■ BARE-BUZZING. The United States Attorney in Cleveland has taken a local pilot to court on behalf of FAA asking $6,000 in civil penalties for violations of FAR 91.79 and 91.9. The rules cover minimum safe altitudes and careless or reckless operation. The pilot is charged with flying too low over a Cleveland area nudist camp last summer--not once, not twice, but eight separate times.

■ TEST GUIDE FOR AIRSHIPS. A new flight test guide has been published by FAA to assist applicants in preparing for their airship class rating under Part 61 (Revised) rules. The guide, which is also helpful to instructors, FAA inspectors and designated examiners, includes data on pilot operations, procedures and maneuvers relevant to the flight test. AC 61-63 "Flight Test Guide (Part 61, Revised) Private and Commercial Pilot, Lighter-Than-Air, Airship" is available free from DOT/FAA Publications Section, TAD 443.1, Washington, D. C. 20590.

MS. CO-PILOT. Judy Congreve, 23, prepares for a DC-8 simulator flight with instructor B. J. Miller at United Airlines Denver Flight Training Center. Judy, a pilot for the Pegasus Travel Club in Harrisburg, Pa., is the youngest woman to transition as DC-8 co-pilot.

Underwing "N" Numbers Proposed for General Aviation

A new FAA proposal would require airplanes to display the "N" number on both the vertical tail or side of the fuselage *and the underside of the wing*. The new under-the-wing markings would make it easier for people on the ground to identify aircraft violating minimum altitude requirements and noise abatement procedures. FAA believes such identification could also serve as a deterrent to potential offenders.

The under-the-wing number would be 18-inches high or 60 percent of the wing chord, whichever is less. The present 12-inch markings on the vertical tail or side of the fuselage would be retained for all aircraft except those that are slower than 180 knots (at 70 percent of power). For these slower aircraft, the number displayed on the fuselage or tail could be as small as three inches high, and when placed on the vertical tail could be displayed in either a vertical or horizontal manner.

New aircraft or those newly marked or painted, would have to use the new marking six months after the adoption of the rule; all aircraft would be required to do so within five years after the date of the rule.

Comments on the proposal (74-36) must be submitted to FAA AGC-24, Washington, D.C., 20591, by February 19, 1975.

New Written Test Guides Published for Revised Part 61

Two new written test guides have been published by FAA for use by persons seeking certification under the revised provisions of FAR Part 61, which became effective November 1, 1973.

The "Commercial Pilot Written Test Guide" (AC 61-71) outlines aeronautical knowledge requirements, provides source material, and presents sample test questions with answers, explanations and illustrations similar to those used in the current written examination. Price is 85 cents.

The "Flight Instructor Airplane Written Test Guide" (AC 61-72) contains study outlines and a list of recommended study materials, and tells where to obtain these. It also includes a sample test with explanations of the correct answers. Price is $1.25.

Both publications are available at Government Bookstores or by mail from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Ban on Trash Dumps Near Airports

FAA has taken steps to minimize the danger of bird strikes to aircraft by issuing guidelines aimed at banning trash dumps or landfills near airports. Airport areas are often chosen for dumps or landfills because of the low cost and availability of such land. Concentrations of birds gathering about garbage dumps have resulted in a number of serious bird-strike accidents near airports.

FAA field personnel are advising local airport operators that garbage dumps should not be located within 10,000 feet of runways used by jets, or within 5,000 feet of those used by piston aircraft. If existing dumps cannot be closed within a reasonable time they should be operated in a manner that will minimize their attractiveness to birds.

Most public airports are owned and operated by local governments which also have the power to regulate, through zoning and other laws the use of the land around the airport. If these public airports have received Federal aid funds, failure to observe the recommended distance for garbage dump locations could place the airport in non-compliance of their grant agreement commitments and jeopardize further financial aid.

Operating Rules to be Reviewed

The Federal Aviation Regulations covering general operating and flight rules will be the subject of a second two-year review program, patterned after the biennial Airworthiness Review Program. The latter program, now in the mid-point of its planned two-year cycle, has been enthusiastically received by all facets of the aviation industry.

The format and timespan of the two review programs are similar, but schedules will be staggered with discussion conferences held in alternate years. In announcing the new review program, which includes certification of airmen, commercial operations and schools, and air carriers, Administrator Alexander P. Butterfield described the program as an FAA effort to "scrape the barnacles from its regulatory process."

Ground Proximity Warning for Jets

A newly adopted FAA rule requires that a "ground proximity warning system" be installed in all large turbine powered airplanes operated by airlines, air travel clubs and air taxi operators by December 1, 1975. The equipment would automatically provide visual and aural warnings whenever the plane approaches a ground obstacle under specified conditions.

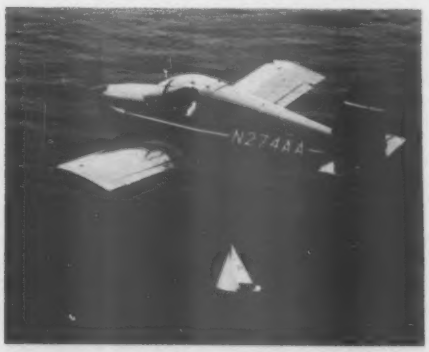
According to the National Transportation Safety Board, flight crew lack of altitude awareness or position awareness have been factors in at least 15 air carrier accidents since 1968, and may be a factor in half a dozen other such tragedies which have occurred since that time and which are still under investigation.

• Overwater Watch

Your article "Island Hopping" in September was both informative and well-timed with respect to an increasing seasonal influx of overwater flights each winter. As an air traffic controller at Palm Beach and a private pilot, I hope you will mention the availability of air traffic control services to pilots going to and from the islands. We controllers sometimes go out of our way, traffic permitting, to provide radar advisories (which is our least priority of duties with respect to radar) because we realize—as your article stresses—that for many this is the first overwater voyage.

With sufficient altitude, transponder or not, most flights between the United States and the Bahamian island chain can be flown completely under radar coverage. If pilots will take advantage of this service when going to the islands and returning, it will provide peace of mind for pilot and passengers and also help expedite landing sequences and avoid conflicting patterns of flight with traffic departing from the airport.

Darrell R. Hatchett
W. Palm Beach, Fla.



• ELT Squawks

Your recent article on emergency locator transmitters (ELTs) made light of two glowing defects. First, the monitoring system is grossly inadequate. Regardless of the monitoring by FAA towers and aircraft and voluntary monitoring by commercial aircraft there are many remote areas away from airways and towers, particularly in the mountains, where the chance of a signal being picked up is doubtful. Secondly, unless a pilot is listening on the emergency frequency he would not know whether his own or someone else's device is transmitting. It would make more sense if the ELT could receive on the emergency frequency as well as transmit. Then all equipped aircraft would be listening.

Also, I think that $20 is an excessive cost for replacement of battery (NAPCO) when a few alkaline "C" or "D" cells would do the same job.

Albert Signorella, D.D.S.
Nantucket, Mass.

The ELT monitoring system has been studied extensively and recommendations are being drawn up for improvements. Meantime the vast search and rescue nets of the Air Force and Coast Guard are at the disposal of fliers in distress; these efforts are resulting in the rescue of more than one person each week.

The ELT standards were prescribed to keep prices down as much as possible for the consumer without sacrificing the lifesaving purpose of the device. Since each added function also adds cost, the required *features were kept at a minimum with others available as options to the purchaser. Several ELTs have receiving capability and there is no rule prohibiting ELTs being incorporated into radio receivers and transmitters.*

As for batteries, ELT must have a radiated output of 75 miliwatts after 48 hours of continuous transmission at minus 20 degrees C. Manufacturers select the batteries best suited to the needs, with weight, volume and available energy having a bearing on their choice.

• Little Boxes That Cry "Wolf"

After reading your excellent article on ELT in September, some of my animosity for the little boxes has disappeared. The fact that ELTs have saved lives makes the countless searches at our facility for falsely triggered units tolerable.

One of the main problems seems to be self-installation by private aircraft owners. Recently we discovered an ELT wailing away in a parked *Bonanza*. The owner had installed it next to the right seat bulkhead and when the passenger deplaned, his knee activated the unit. Pilot education as well as more spot checks by FSDO Inspectors would go a long way in solving the "cry wolf" problem that plagues us at large facilities.

Richard E. Hrabko
Spirit of St. Louis Airport

• Position Reports at Non-Tower Airports

In September your reply to a letter, "Passing Through the Pattern" stated that "many pilots take the precaution of announcing their position on 122.8 at airports where there is no UNICOM." Shouldn't that be 122.9?

Tommy M. Williams
St. George, S.C.

122.9 is correct if there is no UNICOM or other facility on the airport. Airman's Information Manual, Part I, recommends the following frequencies for reporting position and intentions at non-tower airports:

122.8 if there is UNICOM on the field, even if you are unable to establish contact.
122.9 if there is no facility on the airport (this is the air/air channel)
123.6 if there is full-time or part-time FSS there, which is either open or closed at the time, (unless FSS location also has a part-time tower which is closed at the time—in that case you would use the tower frequency for your "blind" broadcasts).

• The Legal Operator

In the July Forum you state that a private pilot or better and his flight instructor may both log as pilot in command the time during which the pilot is the sole manipulator of the controls of an aircraft in which they are both qualified. Given this relationship, who is the *legal operator* of the aircraft?

Name Withheld

That would depend upon numerous factors, such as what is said and done just prior to the flight, or prior to any incident that happened to occur. Sometimes after an accident the final determination is made in a court of law. If you are concerned about a specific situation, check with the FAA Regional Counsel for your area.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Instrument Instruction

Under "old" Part 61 a certified flight instructor (CFI) could give instrument instruction to commercial, instrument and private pilots within certain limits, even if he had no instrument rating on his pilot or instructor certificates. The new Part 61 requires all instruction be given by an instructor with ratings on both his pilot and instructor's certificates for the type of instruction he gives. Does this preclude a CFI from giving a private pilot applicant the required instrument instruction required by 61.107?

Walter S. Kyle
Ft. Lauderdale, Fla.

A CFI without an instrument rating may give all the instruction necessary for a private pilot certificate. An applicant for an instrument rating is required to have "40 hours of simulated or actual instrument time, of which at least 15 hours must be instrument flight instruction." In this case the CFI must have an instrument instructor rating.

• The Cost of Knowledge

FAA AVIATION NEWS is a good looking publication and well organized in its material. However, I am not renewing my subscription because of the unconscionable cost increases. Government services should be supplied at the break-even point and should be available at considerably less cost than from private business, particularly since non-government sources must operate at a profit to remain in business.

Irv Brown
Brooklyn, N.Y.

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At about 50 cents a month, FAA AVIATION NEWS is still one of the most economical forms of flight insurance we know of.

• Transponder vs. Navcom

Our flying club has funds to add just one piece of avionic equipment to our Cherokee 180, but the members disagree as to what it should be. Half want a transponder and the others want a second radio/VOR. Our plane is used half its time on cross country and the rest local. I would appreciate FAA's advice on solving this problem with regard to both safety and practical usage.

Bob Leach
San Jose, Calif.

The answer depends on what kind of cross country flying is done (distances, terrain, etc.), and what kind of terminals will be flown into (high density? TCA?). Also, are any of the members instrument rated, or do they plan to be soon? Suggest you discuss this matter with either an FAA Accident Prevention Specialist or Counselor who is familiar with your flying environment and plans.

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